UNIVERSITY OF PENNSYLVANIA

RAILROAD FREIGHT CAR SERVICE:

CONTROL BY THE CAR SERVICE DIVISION OF THE AMERICAN RAILWAY ASSOCIATION

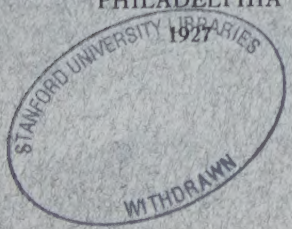
SHIH-HSUAN KING

A THESIS

IN ECONOMICS

PRESENTED TO THE FACULTY OF THE GRADUATE SCHOOL IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY

PHILADELPHIA
1927



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To
My Teacher
Emory R. Johnson

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March 10, 1927

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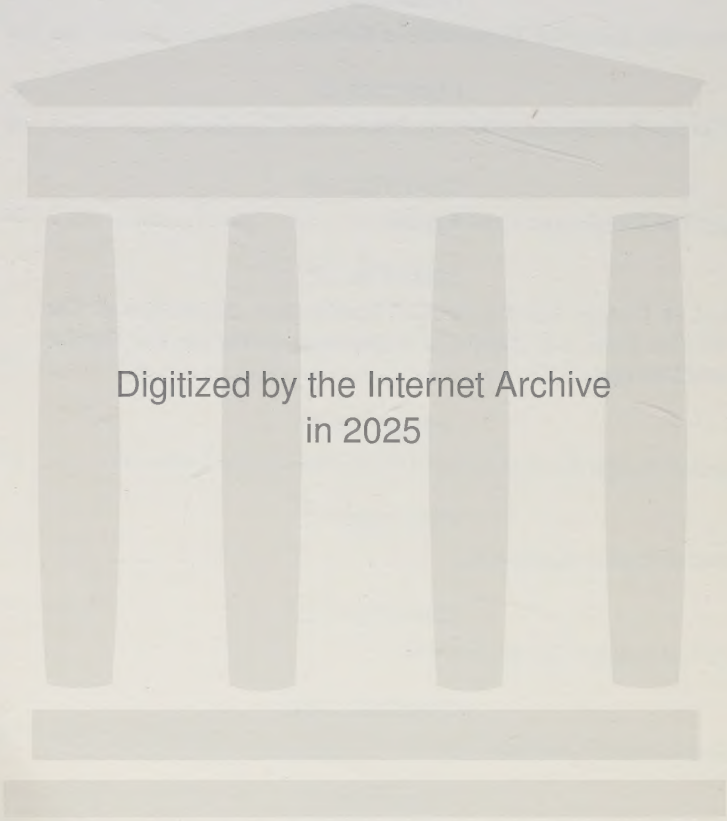
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Chapter I

Introduction: Adequate Transportation Service

This paper discusses the system of control of freight car service by the Car Service Division of the American Railway Association, and shows how that system has enabled the steam railroads in the United States to provide adequate transportation service to the public.

To provide adequate transportation service to the public is the primary obligation resting upon the railroads. The test of adequacy of transportation service is whether freight cars are promptly furnished to the shippers for loading of freight, and whether freight is promptly moved to destination for delivery to the receivers.

Since the summer of 1923, the railroads in the United States have continuously provided adequate transportation service. While railway freight traffic has increased during the past four years, there have been no transportation difficulties, congestion, or car shortage, except in certain isolated instances of a temporary nature.[1] In 1926 the greatest volume of railway freight traffic ever tendered by the shippers for transportation, averaging over a million car loadings a week, was moved by the railroads not only without transportation difficulties but also with the greatest speed and despatch yet attained by American railroads.

This adequate and efficient transportation service has produced far-reaching effects on both the railroads and the public. It has contributed largely to the placing of business on a stable basis, and has enabled industry to maintain smaller stocks than has ever possible been before. This has resulted in sub-

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[1] Chart I in the appendices shows a consistent annual increase of average weekly revenue freight car loadings, a continuous surplus of freight cars above traffic requirements, and a reduction of freight accumulations almost to the vanishing point.

stantial savings to the public.[2] Moreover, railway revenues have been increased, and public relations have been improved.

Prior to 1923, car shortages and freight accumulations were seasonal in nature and nation-wide in scope, appearing in 1916, 1917, 1918, 1919, and 1920, and again in 1922–1923. The inadequate and uncertain transportation service gave rise to bitter arraignment of the railroads. Shippers complained of loss of profit, and consumers of extortionate prices. The relations of the carriers and the public were strained. The railroads were not able to fulfil their obligation of providing adequate transportation service, and the regulation of railroads by the government did not fully accomplish its purpose.

The improvement of transportation service since 1923 is in itself a remarkable accomplishment. More remarkable is the fact that this improvement has been brought about by using no more freight cars and locomotives than were in service in 1920.

The contemporary development of co-operative efforts among carriers and between carriers and shippers is fundamentally responsible for this remarkable improvement of transportation service. When the greatest of car shortgage and freight accumulations occurred in 1922–1923, the public despaired of the inability of the carriers to move products, and agitated for intervention by the government. This caused the railroads to come together on April 5, 1923, and to adopt a "Program to Provide Adequate Transportation Service."[3] This Program was "to make effective the continuation of the active co-operation by the managements of the several carriers as a whole and to provide adequate transportation for the country's growing requirements." It called for large capital expenditures for betterments and additions to road and equipment, reduction of freight cars and locomotives in need of repairs, improvement in freight car loading and movement, complete co-operation with the Car Service Division of the American Railway Asso-

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[2] The relationship of adequate transportation service and business is discussed in detail by Carlson S. Duncan (Economist of the Association of Railway Executives): Some Business Aspects of Adequate Transportation Service, *Harvard Business Review*, January, 1926, pp. 145–152.

[3] American Railway Association: Program to Provide Adequate Transportation Service in 1923–1924.

ciation, and establishment of intimate relations between carriers and shippers.

Large capital expenditures for betterments and additions to roadway and structures and equipment, including locomotives and cars, have increased the physical capacity and the efficiency and economy of operation of the railroads.[4] While the line mileage of road owned has slightly decreased, the miles of tracks operated have steadily increased. Although the total number of freight cars remains almost unchanged, one-third of them have been installed during the past six years, and the average carrying capacity has gradually increased. Similarly, although the number of locomotives has slightly decreased, nearly one-sixth of them have been installed during the past six years, and the average tractive power also has increased. In other words, instead of increasing the number of freight cars and locomotives, the American railroads have installed larger cars and more powerful locomotives, retiring lighter and obsolete types.

Equipment has been kept in more serviceable condition. There are fewer locomotives and freight cars in need of repairs. Freight cars have been moved faster than ever before. The performance of equipment has been improved. The average train load has increased. The average freight car load has not been materially increased because light-loading commodities now constitute a larger share of the total traffic than was formerly the case.

To meet satisfactorily transportation requirements of the country as a whole and in different sections is dependent not only upon the number and kinds of cars owned by the railroads, but also upon the method of the distribution of cars among them in accordance with their relative requirements. During recent years, a more effective system of control of freight car supply and distribution on and between the railroads has been worked out by their central agency, the Car

[4] Tables I, II, and III in the appendices show the relative growth of railway freight traffic and transportation facilities on all steam roads from 1920 to 1925, equipment installed, retired, and in need of repairs, and freight car performance on Class I roads from 1920 to 1925.

Service Division of the American Railway Association. The movement of traffic from loading points to terminals or markets has been gradually brought under control. Shippers have come to understand the carriers' problems, and have co-operated with the railroads through the Regional Shippers' Advisory Boards.

The Car Service Division is a central agency of the member railroads of the American Railway Association. It is given power to preserve equity between the railroads as regards freight car supply and ownership, and is also authorized to deal with the Interstate Commerce Commission in all matters concerning freight car service on and between the railroads. It is empowered to take such expedient action as is necessary to meet any car shortage or transportation emergency that may arise on any road or in any territory. It was first organized in 1917 to meet the War transportation emergency. Its head office is maintained at Washington, D. C., and a number of district offices are located at strategic points in different sections of the country.

Experience of the Car Service Division shows that there are certain fundamental difficulties in connection with the provision of adequate transportation service by the railroads in the United States:

(1) In the past there has been lack of adequate information as to freight car requirements and as to car supply; consequently, supply and requirements have not been equalized. The Car Service Division has made studies of economic and transportation conditions throughout the country, and has obtained from shippers periodical reports of car requirements and from carriers statistics of car supply.

(2) Car shortages in the past have been accentuated by the non-observance of the Car Service Rules, which govern the return of freight cars after leaving the home road, by the misuse of foreign cars, and the consequent unequal distribution of cars among various roads. The Car Service Division has effectually supervised the enforcement of the Car Service Rules, and has thereby brought about a more equitable distribution of cars among various roads and territories. It has also taken charge of the territorial adjustment of car surplus and shortage by

suspending the Car Service Rules 1 to 5, inclusive, when necessary, or by transferring cars from one road or territory to another with due regard to both car ownership and traffic requirements. The most difficult problems insofar as car supply and distribution are concerned are the supply and distribution of box cars for the transportation of Western grain, of refrigerator cars for the transportation of perishables from the Pacific Coast and the Southeast, and of open-top cars for the transportation of coal. It is with these three problems that the Car Service Division has been most concerned.

(3) Another difficulty in the past has been the frequent accumulation of traffic at terminals and the lack of a co-ordinated system of control over traffic movements by carriers and shippers. The Car Service Division has put into effect a uniform embargo system. It has developed various methods to promote a regular, orderly movement of traffic from shipping points to transshipment points and to terminals. It has conducted an active campaign to expedite the loading and unloading of cars by shippers and receivers and to eliminate delays in the handling of cars by carriers.

(4) Car shortages in the past have been somewhat caused by the slow movement and light-loading of cars. The Car Service Division has constantly called the attention of carriers and shippers to the necessity of faster movement and heavier loading of cars.

(5) Car shortages or unsatisfactory transportation service caused shippers to complain to the Inter-state Commerce Commission or to the various state commissions. In order to promote the informal settlement of complaints and to secure the co-operation of the public in car service matters, the carriers have brought about the establishment of the Regional Shippers' Advisory Boards in different sections of the country. These Boards have co-operated with the railroads in anticipating and estimating car requirements, adjusting car supply and distribution, controlling traffic movements, and promoting car performance.

REFERENCES TO CHAPTER I

This paper is based primarily upon the publications of the Car Service Division of the American Railway Association and upon information secured by the writer from personal interviews with the staff of the Car Service Division. The most important references for the entire subject under discussion are enumerated here while those for particular phases of the subject are given in the respective chapters.

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Chapter II

The Car Service Division: History, Powers and Organization

At the outset it may be interesting to trace the development of the Car Service Division of the American Railway Association since its creation in 1917. The story of the change from the chaos and confusion in 1916 and 1917 to the order and calm confidence in the years since 1923 is full of interest.

The Car Service Division was primarily a product of transportation emergencies of the railroads, which were marked by the non-observance of the Car Service Rules and retention of foreign cars, car shortages, and terminal congestion, and followed by public complaints and government investigations. Such an emergency arose first in 1916 and 1917. Prior to that time, the railroads had generally rendered a satisfactory transportation service insofar as car supply is concerned except in 1906 and 1907. As a result of the unprecedented War traffic, an alarming nation-wide car shortage developed. No road respected the ownership right of another: foreign cars were held for continuous local use despite the Car Service Rules which govern the return of cars to the owning road. The Interstate Commerce Commission made a far-reaching investigation of car supply in November, 1916.[1] Then, on May 29, 1917, the Esch Car Service Act was passed, authorizing the Commission to suspend the Car Service Rules and to issue orders directing the supply and movement of cars from one road to another. Before the passage of the Esch Act, the Commission had no power to regulate car service saving by means of an administrative finding of facts where discrimination had been found to exist.

During the progress of the investigation by the Commission, the American Railway Association gave plenary powers to supervise Car Service and Per Diem Rules to its Commission on Car

[1] 42 I. C. C. 661, decided in January, 1917.

Service, which had been originally created in 1912. In February, 1917, however, the Association reorganized this Commission and appointed five railroad officers of practical experience, fairly representing the different sections of the country. The new Commission was to sit at Washington, D. C., so that it could co-operate with the Interstate Commerce Commission in the administration of the Car Service Rules and make such modifications in the Rules as were found necessary. When the Railroads' War Board was created in April, 1917, this Commission on Car Service became a part of its organization. In December, 1917, the Eastern railroads took a further drastic step by pooling their coal-carrying cars, that is, by placing them in common use without regard to ownership. This represents the first stage of the development of the Car Service Division.

Although the railroads tried hard to demonstrate to the government that they could meet the War transportation emergency and that government control was unnecessary, they were taken over by the federal government on January 1, 1918. The Commission on Car Service then became the Car Service Section of the Division of Operation of the U. S. Railroad Administration, and was empowered to deal with all matters relating to car service. During the period of federal control, freight cars were used without regard to ownership, terminal facilities were placed in joint use, and traffic movements at important gateways were jointly controlled.

The third stage of the development of the Car Service Division came in 1920. The federal control terminated on March 1, 1920, under the terms of the Transportation Act of 1920, which gives the Interstate Commerce Commission vast powers to regulate car service.[2] The Commission on Car Service was again created by the American Railway Association, and in September,

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[2]The Car Service provisions of the Transportation Act are incorporated in the Act to Regulate Commerce, Sec. 1, paragraphs (10) to (17), inclusive. All carriers are required to furnish safe and adequate car service, to make just and reasonable distribution of coal cars, and to file their rules and regulations with respect to car service with the Commission. The Commission is authorized to establish rules and regulations with respect to car service when it deems necessary to do so, and to direct car supply, distribution, and movement in case of emergency.

1920, its name was changed to the Car Service Division. In 1920 there was a sudden and unprecedented demand for transportation while owing to the federal control the common use of equipment and the neglect of repairs had reduced the standard of maintenance. Both the Interstate Commerce Commission and the Car Service Division acting to meet the emergency, issued orders directing fleet movements of cars from one road to another practically without regard to ownership.

In 1921 and 1922, traffic was considerably reduced, and there was a huge car surplus. But the greatest car shortage since 1907, when figures of car surplus and shortage were first collected, took place in the fall and winter of 1922 and the spring of 1923. The shortage was preceded by the strikes of coal miners and railroad shopmen. Once again, the Interstate Commerce Commission and the Car Service Division found it necessary to issue orders relocating cars from one road to another. The Commission entered an investigation in December, 1922, regarding the adequacy of locomotives and cars, and another in January, 1923, as to the efficiency and economy of railroad operation.[3] Both investigations, however, were later dismissed.

The public agitation during this transportation emergency produced the now famous railroad program adopted on April 5, 1923, which represents the fourth stage of the development of the Car Service Division.

The authority of the Car Service Division to control freight car service is given in the Car Service and Per Diem Agreement, and in Rule 19 of the Code of Per Diem Rules, endorsed by all of the member railroads of the American Railway Association. This agreement gives the Car Service Division plenary powers to "co-operate with the Interstate Commerce Commission in all car service matters on and between all railroads," and as the agent of the railroads, to receive from the Commission all orders and directions with respect to car service in accordance with the provisions of the Transportation Act.

Per Diem Rule 19 defines in detail the duties of the Car Service Division as follows:

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[3] I. C. C. Dockets Nos. 14489 and 14556.

(a) To supervise the application of Car Service and Per Diem Rules.

(b To suspend or permit departures from Car Service Rules 1 to 5, inclusive.

(c) To exempt when necessary, cars of any types from the provisions of Car Service Rules 1 to 5, inclusive, and provide other regulations under which such cars shall be handled.

(d) To transfer cars from one railroad or territory to another when necessary to meet traffic conditions, with due regard to car ownership and requirements (see note).

(e) To conduct investigations, including examination of car records, as may be necessary to insure the observance of Car Service and Per Diem Rules, and of any orders issued by the Car Service Division, and in the event that they are unable to adjust such matters with the individual railroads, report all the facts with a recommendation to the Board of Directors.

(f) To obtain car location statements and other car performance statistics as deemed necessary.

(g) To take necessary action to bring about uniformity of practice among railroads by the standardization of car distribution rules, including car record and report forms.

(h) To make recommendations to the Board of Directors when in their opinion a change in the per diem rate is necessary or desirable.

(i) To perform such other duties as may be assigned by the Board of Directors.

The Car Service Division is one of the many committees or divisions of the American Railway Association, which is the central organization of steam railroads in the United States, Canada, and Mexico, and whose purpose is "by recommendation,

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NOTE TO (d). This provides an adjustment of surplusages and shortages, and is intended to suggest an equalization of service so far as practicable and consistent with car ownership. By the latter is meant that if one railroad has, in its good judgment, provided amply for its coal-loading patrons, for example, while another has not, and the demand is generally equal to supply, the mines of the first will not necessarily be depleted in order that the mines on the improvident road may be the better served. Generally, as between the provident and improvident roads, it must be recognized that if in time of great car demand the latter has to be assisted for the benefit of its patrons and its territory at the expense of the former, there must necessarily be set up some method of compensation for the former, and this of necessity may go beyond mere car hire. In treatment of "short lines", or "feeders", without any appreciable car ownership, such lines be given a measure of car supply from "trunk lines" consistent with current distribution percentages on such trunk lines; in other words, they must be treated as industries on the trunk line connection.

to harmonize and co-ordinate the principles and practices of American railroads with respect to their construction, maintenance, and operation."[4] The Association has a Board of Directors, an Executive Committee, a President, two Vice-Presidents, a General Counsel, and a Secretary-Treasurer. The work of the Association is conducted through seven main divisions, namely, Operating, Transportation, Traffic, Engineering, Mechanical, Purchasing and Stores, and Freight Claims; and four special departments known as the Car Service Division, the Committee on Automatic Train Control, the Committee on Fuel Conservation, and the Committee on Inspection of Standard Materials.

The Car Service Division situated at Washington, D. C., has a Chairman and six members, chosen on a territorial basis, all of whom are appointed by the Board of Directors of the American Railway Association. Having grown since 1923, its organization now consists of a head office at Washington, D. C., thirteen district offices in different sections of the country, and a number of Car Service Agents. It is also the sponsor for the organization of the fourteen Regional Shippers' Advisory Boards, which furnish a general channel of contact between carriers and shippers.

At the head office at Washington, D. C., are the Chairman, one Secretary, and five Managers each in charge of a particular phase of control of freight car service. The Manager of the Railroad Relations Section deals with all questions relating to Car Service and Per Diem Rules, and takes general charge of Car Service Agents. The Manager of the Public Relations Section supervises the relations between the Car Service Division, shippers and shippers' organizations, governmental, state, county, and municipal authorities. The Manager of the Closed Car Section supervises the location, re-location, and distribution of closed cars, including box, stock, and ventilated cars. The manager of the Open Car Section supervises the location, re-location, and distribution of open cars, including coal, hopper, mill-type, and flat cars. The Manager of the

[4] American Railway Association: Articles of Organization, 2.

Troop Movement Section supervises all matters connected with the movement of troops. In addition, there is a Manager in charge of the location, re-location, and distribution of refrigerator cars with office at Chicago.

The control of feight car service by the Car Service Division has been decentralized and improved. The country is divided into fourteen districts, and District Managers are assigned to all districts, but one, which is taken care of by the head office of the Car Service Division. The geographical assignments of these District Managers and the location of their offices are shown on Map I in the appendix, and their duties are briefly as follows:

(a) To establish and maintain a closer and local relationship with railroad officers, to the end that car distribution may meet most effectually the demand of commerce and Car Service Rules be understood and observed.

(b) To provide a neutral point of contact with shippers and their associations for the purpose of a mutual understanding of common problems, particularly to secure their co-operation in the enforcement of Car Service Rules by a knowledge of their underlying principles and of the necessity for the Rules in order to equalize car distribution between different sections of the country.

(c) To localize the supervision over the work of Car Service Agents engaged in checking the observance of Car Service Rules and special instructions, and by a close contact with the operating conditions in each territory, to insure the practical application of such regulations.

To assist the Car Service Division and its District Managers in the enforcement of Car Service Rules and the supervision of other related car service matters, a number of Car Service Agents are employed. Each Agent is assigned to an individual area within which he attends to car service matters in a manner similar to that employed by the District Managers.

To solicit the practical co-operation of shippers and their organizations in all matters with respect to car service, the Car Service Division has organized in territories where the District Managers are located the Regional Shippers' Advisory Boards, the origin, organization, and activities of which will be discussed later.

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Chapter III

Freight Car Requirements and Supply

In the past one of the fundamental difficulties in connection with the provision of adequate transportation service has been the lack of information as to the freight car requirements of the shipping public and the freight car supply of the railroads. Consequently, there has been an inability to balance the two factors. The Car Service Division has attempted to obtain information upon which to estimate and anticipate car requirements of the country as a whole as well as of different sections and that upon which to determine car supply of various railroads.

The volume of car units required to meet the loading orders of the public is affected by

(1) The volume and character of railway traffic;

(2) Changes in production and consumption of commodities resulting in annual fluctuations of railway traffic;

(3) Uneven distribution of commodities depending on business policies regarding stocks, storage facilities, etc., which causes seasonal fluctuations of railway traffic;

(4) Inter-relationship of the density of population and the location of industries and agricultural products in different sections of the country and the currents of railway traffic.

Before describing the methods employed by the Car Service Division to estimate and anticipate car requirements, it is necessary to discuss briefly each of the above factors.

The volume of railway freight traffic can be measured by tonnage originating, ton-miles, or cars loaded. The last named, although it takes no account of either tonnage or mileage, is preferred to the other two for the purpose of estimating car requirements. Average weekly car loadings of revenue freight have been compiled by the Car Service Division since October, 1917, from the member railroads of the American Railway Association, including not only Class I roads but also some terminal and switching companies. Car loadings are grouped

into grains and grain products, live stock, coal, coke, forest products, ore, merchandise—L. C. L., and miscellaneous, and all member roads of the Association are assigned to one of the following districts for statistical purposes: Eastern, Allegheny, Pocahontas, Southern, Northwestern, Centralwestern, and Southwestern.

Revenue freight car loadings have consistently increased from year to year as shown on Chart I, rising from 44,592,089 in 1918 to 45,118,472 in 1920, 51,177,962 in 1925, and 53,309,644 in 1926. In 1920 there were first recorded several "million car weeks", which, however, have become common since 1923. The magnitude of the task of loading one million cars a week can be understood better when compared with the fact that freight cars in the United States amount only to approximately two and a half millions.

Car requirements are somewhat affected by a change from heavy-loading, low-grade commodities such as coal to light-loading, high-grade commodities such as merchandise, or vice versa. In each year since1922, car loadings have exceeded those in 1920, and yet the increase in ton-miles from 410,306,209,802 in 1920 to 413,823,173,485 in 1925 has been relatively small. This is primarily because of the change of the relative shares of various commodities to the total traffic.[1]

The annual and seasonal fluctuations of railway freight traffic reflect the spasmodic, irregular demand for transportation, and result in excessive peak car loadings, acute car shortages, and freight accumulations, or excessive valley car loadings and huge car surpluses. Annual traffic fluctuations are caused by changes in the production and consumption of commodities,

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[1] Distribution of car loadings by commodities:

	1920	1925
Grains and Grain Products	4.1	4.5
Live Stock	3.4	3.2
Coal	22.4	17.3
Coke	1.4	1.2
Forest Products	6.8	7.3
Ore	5.3	4.0
Merchandise—L.C.L	20.0*	25.7
Miscellaneous	36.6	36.8

* Not comparable with subsequent years partially included in Miscellaneous.

that is. the changing economic activities of agriculture, industry, and commerce. Thus, the great business expansion during the War period of 1916, 1917, and 1918, the abnormal business inflation in 1920, the depression in 1921 and 1922, the revival in the second half of 1922 and in 1923, the recession in 1924, and the prosperity in 1925 and 1926—have all affected an increase or decrease in railway freight traffic. While seasonal fluctuations of traffic returning year after year with great regularity can be anticipated, a sudden business boom, accompanied as it usually is by an unprecedented demand for transportation, is a difficult problem.

Within each year railway traffic fluctuates in a fairly regular manner, steadily declining from the spring until the summer, then advancing from late summer to the fall and winter, and declining again in late winter. This seasonal traffic movement is caused, not by any changes in economic conditions or in the supply of cars, but by nature's provision for the harvesting of agricultural products, weather conditions in the more northernly latitudes, and the practice of consumers in purchasing commodities according to their ability or inclination to meet their needs.

There are two characteristics of the seasonal traffic movement. First, the peak or maximum car loadings always take place in the second half of each year, and the minimum car loadings in the first half. Secondly, the ratio of traffic transported in each month or quarter to the yearly aggregate does not change greatly from one year to another. The bulk of crops must of necessity be shipped in the second half, and so, a shift of any other commodity from the second to the first half will permit an unusual opportunity for the constant use of every unit of transportation facilities. Serious efforts have been directed to the balancing of traffic between the four quarters of the year. Coal consumers are urged to purchase and store coal in the summer, and carriers to move their fuel supply and other company material in the first half.

The currents of freight traffic are primarily controlled by the density of population, resources, and the location of industries. In the Eastern District, that portion of the United States east of the Mississippi and north of the Ohio and the Potomac, there is 47.6 per cent of the total population in the United States,

140 people per square mile, and 72.6 per cent of total manufacturing industries measured by capital employed, but there originated from this area on Class I roads in 1925 only 23.7 per cent of total agricultural products, although the states of Ohio, Indiana and Illinois included in this area are large agricultural states.[2] In the Western District west of the Mississippi, there is only 32.7 per cent of the total population and 16 people per square mile, but there originated in that area 72.1 per cent of grains, 49.1 per cent of citrus fruits, 53.0 per cent of other fresh fruits, 57.3 per cent of total agricultural products; 79.4 per cent of live stock, 62.9 per cent of lumber, 53.5 per cent of forest products, and 56.1 per cent of refined petroleum. In the Southern District, there is found only 19.7 per cent of the total population and 46 people per square mile, but there originated in that area 19 per cent of agricultural products, 47.8 per cent of citrus fruits, 41.7 per cent of bituminous coal, and 25.7 per cent of lumber.

[2] Distribution of population, location of industries, and car-load traffic originating on Class I roads by commodities in 1925:

		PER CENT TO TOTAL		
	UNITED STATES	EASTERN	SOUTHERN	WESTERN
Population	105,710,620	47.6	19.7	32.7
Density of population per sq. m. (1920)	35	140	46	16
Manufacturing Establishments, capitalization (1919)	$44,688,094,000	72.6	8.1	19.3
Products of agriculture	4,674,218	23.7	19.0	57.3
Grains	1,263,926	18.4	9.5	72.1
Citrus fruits	84,926	3.1	47.8	49.1
Other fresh fruits	436,381	24.1	22.9	53.0
Animals and products	2,215,166	20.3	7.6	72.1
Live stock	1,557,609	13.6	7.0	79.4
Products of mines	13,476,425	43.2	26.7	30.1
Bituminous coal	6,613,177	40.3	41.7	18.0
Iron ore	1,318,612	6.6	4.7	88.7
Products of Forests	3,831,885	12.5	34.0	53.5
Lumber	3,694,741	11.4	25.7	62.9
Manufactures and Miscellaneous	10,944,078	60.7	11.1	28.2
Refined petroleum	1,636,527	35.6	10.3	56.1
Grand total car-load traffic	35,141,772	41.0	20.9	38.1

This table is adapted from Mr. M. J. Gormley's Distribution of Freight Cars from a Nation-wide Standpoint, except that figures of car-load traffic are brought up to date.

It is obvious that a considerable portion of agricultural products in the West and the South must be shipped for consumption to the densely populated and industrialized East. The return traffic, primarily of manufactured articles, is not only of small tonnage, but also requires fewer cars because manufactured articles are in concentrated form and originate in certain definite localities. Furthermore, those agricultural products in the West and the South destined for export are necessarily moved through the seaports on the Atlantic and the Gulf. Coal, the most important item of traffic, is also moved eastward to the households and industrial plants and to the tidewater ports. Hence, there are predominant East-and North-bound traffic movements.

The greatest problem in connection with the distribution of freight cars in the United States, therefore, is to secure a return from the East to the West and the South of cars arriving with Western and Southern products. Those railroads serving the producing territories in the West and the South have generally built up an adequate car supply as to take care of traffic originating on their lines, but as the number of cars owned is but a portion of what are needed to move all the traffic in a given season, such cars as move out to the railroads in the consuming territories must necessarily be promptly returned, or, there will be a car shortage on the originating roads. On the other hand, in the Eastern consuming territory, the problem is not one of freight car supply, but one of securing the prompt unloading by the receivers of cars arriving from the West and the South and the prompt movement of empty cars away from stations or terminals. Failure to do so will cause congestion at terminals and on the lines of the East and a car shortage in the West and the South.

The methods employed by the Car Service Division for the estimation and anticipation of car requirements consist of the survey of economic and transportation conditions throughout the country, the reports of car requirements by the shippers, and the processes of estimation.

After discussing the factors that affect car requirements, it is evident that in order to arrive at an estimate of car require-

ments, we must take into account the production, consumption, and distribution of those commodities largely entering into railway traffic, that is, the changing business conditions. There are available today comprehensive business statistics relative to production, orders, stocks, and unfilled orders of various commodities; commodity prices, bank clearings, money rates, stock and bond quotations, etc., which can be used to forecast the general trend of business and the probable railway traffic. The Car Service Division has made use of these data in order to gauge production, shipments, and in some cases, prices, of the most important commodities, and to trace seasonal fluctuations as well as variations from year to year in the commodity movements.[3]

A further helpful step was taken when the country was divided into fourteen districts each under a District Manager. In each district, the agricultural, industrial, and transportation problems are of a like nature, and the District Manager is expected to be familiar with them. But it was not until the Regional Shippers' Advisory Boards were organized that the Car Service Division began to make any great progress in estimating car requirements with reasonable accuracy.

The most reliable estimate of car requirements is that based on the reports made by the shippers. In past years, it was a general custom that during times of car shortage, the shippers would order more cars than they actually needed, believing that they might get at least their proportionate share. As a result of this custom, some shippers would get more than their share while others would get nowhere near their actual requirements. The inflation of car orders was, in some cases, materially responsible for car shortages. When the Regional Shippers' Advisory Boards were organized, their many commodity committees were required to prepare quarterly statements of car requirements and of the prevailing conditions of business. On the basis of these statements, the number of cars required for outbound shipments from each of the various districts covered by the Boards could be estimated three months in advance.

[3] Car Service Division: *Annual Bulletin.*

In no other way can territorial car requirements be accurately estimated.

In addition to the quarterly statements, the Boards have furnished from time to time special reports of car requirements, notably the receivers' estimates of inbound shipments in Florida and the shippers' estimates of grape car requirements in California.

It was in connection with the railroad program adopted on April 5, 1923, that the Car Service Division first developed a fairly accurate method for estimating car requirements of a short period. Before that time, no railroad had ever used any systematic method for forecasting traffic. The method of the Car Service Division is based on annual and seasonal fluctuations. Car loadings in the first three months of each year are estimated by

(1) Finding out the ratio of increase or decrease of actual car loadings in the last three months of the immediate preceding year over those in the corresponding period of the previous years;

(2) Applying this ratio of increase or decrease to actual car loadings in the first three months of the immediate preceding year;

(3) Making allowances for those known factors directly related to car loadings, including the quarterly statements of the commodity committees of the Regional Shippers' Advisory Boards as already referred to, and special questionnaires sent out to the shippers, asking for their actual car loadings in the first three months of the previous two years, estimated car loadings in the first three months of the new year, and prospects for the entire new year.

Car loadings in the remaining nine months are estimated on the basis of the seasonal movement of traffic. When the first estimate was made in 1923, it was found that in the period of 1918–1922, between 22 and 23 per cent of total car loadings was handled in the first three months, variations from this percentage in the several years being remarkably small; that car loadings in the first three months would always furnish a fairly good measure of what the traffic of the year as a whole is likely to be; and that if this experience over a period of five

years supplied a good basis of estimation, it would be possible, in any year, about the first of April, to estimate the probable car loadings of the remaining months.[4] To this end, the Car Service Division proceeded:

(1) To obtain the ratio of increase or decrease of actual car loadings in the first three months of the present year to those in the corresponding period of the immediate preceding year or to an average of previous years;

(2) To apply this ratio of increase or decrease to the ratios of the remaining months to the yearly aggregate in the preceding year or years;

(3) To determine the peak load of the year.

In addition, any estimate of traffic must make provision for any unforeseen factors such as prolonged industrial or railroad strikes, other transportation disturbances, crop failures, etc.

The estimates of car loadings made by the Car Service Division have proven to be fairly accurate, the percentages of discrepancy being remarkably small. Estimated car loadings in 1923 were 2.0 per cent less than actual; 2.9 per cent more in 1924; and 1.4 per cent less in 1925.

Freight car supply, that is, the number of cars available for transportation service, is affected not only by the number and carrying capacity of cars owned, but also by their serviceable condition, their efficiency in loading and movement, and the availability of the motive power. Car shortages in the past were accentuated by bad-order cars, light loading, slow movement, or shortage of locomotives. While the information of car requirements is of necessity obtained from the shippers, that of car supply must come from the carriers, and from them the Car Service Division receives the following reports:

(1) A monthly equipment ownership report shows the number and aggregate carrying capacity of freight cars and the number and aggregate tractive power of locomotives, both by classes, owned, installed, retired, and on order.

(2) Two semi-monthly equipment condition reports: one showing locomotives, by classes, on line, serviceable, stored,

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[4] Aishton, R. H.: Forecasting of Railway Traffic.

in or awaiting repairs, awaiting dismantling or sale, and turned out of shops; the other showing freight cars, by classes, on line, awaiting repairs, and repaired. A separate quarterly report is made for passenger cars.

(3) A monthly statement of freight car mileage and tonnage showing by the four directions, both loaded and empty car miles, average cars on line daily, miles per car per day, both revenue and none-revenue ton-miles, and tons per loaded car.

While the performance of freight cars will be analyzed and discussed in Chapter VII, the ownership and condition of both freight cars and locomotives are briefly analyzed here.[5] The number of freight cars owned by the railroads has remained almost constant for several years. Class I roads owned 2,258,855 freight cars in the year ended June 30, 1915, 2,322,122 in the calendar year of 1920, and 2,357,226 in the calendar year of 1925.[6] The aggregate carrying capacity of freight cars on Class I roads, however, increased, being 89,837,847, 98,342,666, and 105,569,386 tons respectively in these years. The serviceability of freight cars has also been increased by the gradual substitution of steel for wooden cars and the gradual standardization of the design of cars and car parts.

Freight cars are classified by the Interstate Commerce Commission into seven classes, namely, box, flat, stock, coal, tank, refrigerator, and other. Box cars are the most commonly used type of cars, constituting 45.7 per cent of the total ownership and 40.2 per cent of the total carrying capacity on Class I roads in 1925. Coal cars are the next in importance, making up 40.4 per cent of the total ownership and 47.1 per cent of the total carrying capacity. All of the other type of cars combined had only 13.9 and 12.7 per cent respectively.

The effect of the motive power on freight car supply is most clearly revealed by reports showing the number of both loaded

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[5] See Chart II, Freight car ownership, physical condition, and performance.

[6] In 1925 all steam roads owned 2,415,037 freight cars. In addition to the railroad-owned cars, there were 262,725 private cars in 1924, according to the Statistics of Railways in the United States for the calendar year of 1924, p. 17. These private cars are primarily owned by industries interested in the movement of their particular products such as petroleum, meat-packing, coal, perishable, etc.

and empty cars awaiting movement at stations or terminals. The ownership of locomotives, both steam and other, was only slightly increased from 62,125 in the year ended June 30, 1915, to 64,732 in the calendar year of 1920, and to 63,975 in the calendar year of 1925, on Class I roads. But their aggregate tractive power was considerably increased, that of steam locomotives being 1,970,295,300, 2,340,761,196, and 2,586,821,720 pounds respectively in these years. In other words, instead of building more locomotives, the American railroads have replaced the existing engines by those of a more powerful type.

The general physical condition of equipment can be attested by the number of bad-order cars or locomotives awaiting repairs and the percentage of bad-order cars or locomotives awaiting repairs to total cars or locomotives on line. Although the railroad program adopted on April 5, 1923, had fixed as its objectives 5 per cent of bad-order cars and 15 per cent of locomotives awaiting repairs, these objectives have not been materialized.

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Chapter IV

Control of Freight Car Supply and Distribution: Supervision of Car Service Rules and Territorial Adjustment of Car Surplus and Shortage

A second fundamental problem in connection with the provision of adequate transportation service has been the abuse or misuse of freight cars used in interchange of traffic and the uneven distribution of cars between the railroads in different sections of the country. To meet this problem, the Car Service Division has been authorized by the railroads to supervise the location, relocation, and distribution of cars on and between them. Specifically stated, it has been empowered:

(1) To enforce the observance of the Car Service Rules, which govern the return of cars after leaving the home road;

(2) To suspend or set aside Car Service Rules 1 to 5, inclusive, when necessary;

(3) To transfer cars from one railroad or territory to another to meet the demand of traffic.

The basic principles underlying the Car Service Rules, the methods employed by the Car Service Division for the enforcement of these Rules, and the major problems of freight car supply and distribution on and between the railroads will be discussed in this and the next chapter. The interchange of freight cars between the railroads, which arises from the necessity of permitting the through movement of cars loaded with freight from the point of origin on one road to destination on another without breaking bulk at the junction point, is a well established practice and must be sustained.[1] There are two fundamental problems arising from this practice: first, which road, the originating or the receiving, should furnish cars necessary for the inter-line traffic; and second, how the car supply of the road furnishing such cars should be protected against the abuse of cars by the road which receives them.

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[1] Missouri & Illinois Coal Co. v. Illinois Central R. R., 22 I.C.C., 39, 1911.

The significance of the first problem is predicated on the following propositions: if each road must furnish cars for all traffic originated on its line, local and inter-line, this immediately places the responsibility for car ownership on the road serving the originating territory; on the contrary, if the destination road should be required to send an empty car for each car-load of freight received from the originating road for further shipments, the responsibility for car ownership would then be transferred from the originating to the receiving road. That of the second problem is based on the following propositions: if the originating road cannot be assured the fair use of its equipment which should normally be returned to the territory where it belongs and is wanted, except where there is a car surplus, its incentive to purchase new equipment is extinguished; on the other hand, if foreign cars are permitted to be sent home empty in the direction the balance of traffic is moving, there is no incentive to acquire new equipment on the part of the road thus affected.[2]

Although the railroads have acquired equipment under varying conditions and for various purposes, they have on the whole provided equipment commensurate with the demand of traffic originated on their lines.[3] A grain road has generally provided sufficient box cars to ship grain to destination, whether local or otherwise, a coal road has purchased coal cars to the extent necessary to take coal to market, etc., always provided that cars leaving the owner's rails will be returned within a reasonable time. The originating road by providing enough equipment to take care of all of the traffic originating on its line can control the flows of traffic and consequently has a competitive advantage. It is to regulate the return to owners of cars used in inter-line traffic and to prevent their misuse by foreign roads that the Car Service Rules, past and present, have been prescribed by the American Railway Association. Such Rules were first

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[2] Report of the Committee on Car Service to the General Committee of the Transportation Division, January 29, 1921, in which the problems of the Car Service Rules are discussed in detail.

[3] Preliminary report of the committee to devise a formula of car ownership to the Committee on Car Service, October 24, 1921.

adopted by the Association and made effective on January 1, 1893, and were entitled "Rules to Prevent Misuse and Diversion of Freight Cars." Although many changes have been made from time to time, the fundamental principles of these Rules remain the same.

The Car Service Division has outlined the purposes of the Car Service Rules as follows:[4]

(1) To keep cars on the lines of the owner to the greatest extent possible, as cars can thus be kept in better physical condition.

(2) Each railroad has purchased equipment which best meets the needs of the shippers. By prompt relocation to the owner, shippers are thereby assisted to the use of the particular class and types of cars which best suit their individual needs.

(3) Loading cars to or via the owner line encourages such line toward a program for increasing car ownership, which naturally reacts to a better car supply for the shippers.

Co-related to the Car Service Rules are the Per Diem Rules, which govern the payment of a rental per car per day to the owner, and the Interchange or Master Car Builders' Rules, which govern the physical care of cars used in interchange.

The present Car Service Rules consist of sixteen rules, but the first five rules are the most important.[5] The first rule

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[4] Car Service Division: Circulars to the shipping public, March 31, 1922, October 19, 1923, and April 1, 1926.

[5] Car Service Rules 1 to 5, inclusive, read as follows:

Rule 1. Home cars shall not be used for the movement of traffic beyond the limits of the home road when the use of other suitable cars under these Rules is practicable.

Rule 2. Foreign cars at home on a direct connection must be forwarded to the home road loaded or empty except as provided in paragraphs (e) and (f). If empty at junction with the home road and loading at that point via the home road is not available, they must (subject to Rule 5) be delivered to it at that junction, unless an exception to the requirement be agreed to by roads involved. Otherwise, cars under this rule may be

(a) Loaded via any route so that the home road will participate in the freight rate, or

(b) Moved locally in the direction of the home road, or

(c) Moved locally in an opposite direction from the home road, or delivered to a short line or a switching road, if to be loaded for delivery on or movement via the home road, or

(d) Delivered empty to home road at any junction point, subject to Rule 5, or

provides that home cars shall not be used for off-line loading when other proper ownership cars are available. This is a very important rule, especially to the originating roads in the West or the South, because the use of foreign cars for off-line loading will help relocate cars to the owners and retain home cars for local shipments.

The second rule provides that foreign cars on a directly connecting road shall be loaded back to the owner if loading can be found. Foreign cars empty at the junction with the owner must be returned at that point empty. Otherwise, cars may be handled according to (a) to (f), inclusive. The enforcement of this rule will relocate more cars to the owners than any other rules.

The third rule provides that foreign cars on other than a directly connecting road must be loaded back to, via, or in the direction of the owner if loading can be found. Otherwise, they shall be sent back via the original route.

The fourth rule provides for the short-routing of empty cars. When a road needs its own cars on a foreign road to be moved back via the shortest route without regard to their original route under load, it may do so at 6 cents per mile.

(e) Delivered empty to road from which originally received under load at the junction where received, if such road is also a direct connection of the home road, or

(f) Returned empty to the delivering road when handled in switching service and owner is not a direct connection in that switching territory.

Rule 3. Foreign cars at home on other than direct connections must be forwarded to the home road loaded or empty. Under this rule cars may be

(a) Loaded via any route so that the home road will participate in the freight rate, or

(b) Loaded in the direction of the home road, or

(c) Moved locally in an opposite direction from the home road, or delivered to a short line or a switching road if to be loaded for delivery on or movement via the home road, or to a point in the direction of the home road, beyond the road on which the cars are located, or

(d) Delivered empty to road from which originally received, at the junction where received, if impracticable to dispose of them under paragraph (a), (b), or (c) of this rule.

Rule 4. Empty cars may be short routed at a reciprocal rate of 6 cents per mile plus bridge and terminal arbitraries, with a minimum of 100 miles for each road handling the car, the road requesting the service to pay the charges.

Rule 5. If a movement of traffic requires return of empty cars to home road via the junction at which cars were delivered in interchange under load, the home road may demand return of empty cars at such junction, except that cars offered to home road for repairs, in accordance with Division V-Mechanical (M.C.B.) Rules, must be accepted by owners at any junction point.

The fifth rule provides that empty foreign cars on a direct connection road may be returned to the owner at the junction where delivered under load if the owner so desires.

Experience of the actual operation of the Car Service Rules in the past thirty or more years shows that when the volume of traffic is comparatively light and there is a surplus of cars, these rules are generally observed, but when there is an urgent demand for cars, they seem to be entirely neglected.[6] The percentage of home cars on home roads to total cars owned is a good measure of the extent to which cars are being returned to the owners. Reference to Chart III, Freight Car Supply and Distribution, shows that the percentage of home cars on home roads closely follows the percentage of car surplus to total cars on line. When the available car surplus diminishes, the percentage of home cars on home roads fa ls; conversely, when the available car surplus increases, it rises.

The per diem charge for cars used in interchange is intended primarily to cover the cost of car ownership, but partly to serve as a means to secure the return of cars to the owner. When a nation-wide car shortage developed in 1916 and the percentage of home cars on home roads fell, the per diem charge was increased from 45 to 75 cents in December, 1916. In April, 1917, it was cut to 60 cents. During the period of federal control, no per diem was required. In 1920, there was another car shortage, and the per diem charge was increased from 60 to 90 cents in March, 1920, and to $1.00 in November, 1920, this $1.00 rate being maintained ever since. Experience shows, however, that during times of heavy traffic, there is a strong inclination, on the part of those roads which have failed to provide an adequate car supply, to hold and use foreign cars no matter what is the per diem charge. On the other hand, during times of light traffic, there is a general incentive to return foreign cars to the owners in order to avoid the charge, or even to load system cars off the line and to send foreign cars home empty in order to earn the per diem. To use system cars for off-line loading instead of foreign cars constitutes an actual

[6] I. C. C. car supply investigation, 42 I.C.C. 662, 1917.

violation of the Car Service Rules while to return foreign cars empty in the direction of the preponderant traffic movement is a potential violation.

Even assuming that the Car Service Rules will be observed and the car supply of the originating roads furnishing cars for inter-line traffic will thereby be protected, the observance of the Rules is conducive to empty mileage. It is provided therein that empty foreign cars shall, if there is no loading available to, via, or in the direction of the home road, be returned empty via the route they were received under load because of the necessity of maintaining equity between loaded and empty mileage. So, if there is loading at the point where a foreign car was unloaded in a contrary direction to that from which the foreign car was received, it is necessary to return the foreign car empty and load another car. The relocation of foreign cars empty via the original route under load instead of the shortest possible route also results in empty mileage. More serious is the cross empty mileage. Although the predominant loaded car movement is East- and North-bound, the observance of these rules permits the mutual return of foreign cars empty between Eastern and Western and Southern roads. In times of car surplus, Western and Southern roads are not infrequently inclined to return box cars belonging to Eastern roads and fit for grain loading on their lines although a short while later such cars are needed for grain movement to the East. Nothing could be more wasteful than this practice from the standpoints of both car supply and performance.

Empty mileage is primarily caused by the necessity of relocating cars to loading points as will be described in Chapter VII. But it is also caused somewhat by the re-location of cars according to the Car Service Rules. Reference to Chart III shows that the percentage of empty to total car mileage somewhat follows that of home cars on home roads.

Whether the Car Service Rules afford the best means for maintaining an adequate and equitable car supply on and between the railroads, for protecting the investment of the car owners, and for promoting efficiency and economy in the handling of cars is a very controversial question. Some have suggested

the abolition of these Rules entirely and instead the formation of a car pool, that is, all cars would be placed in a pool and distributed to the shippers on various roads without regard to ownership but according to loading requirements.[7] Others have advocated drastic methods to remedy the present Car Service Rules, such as the definition of the relative obligation of car ownership in relation to both local and inter-line traffic,[8] the establishment of a general equalization arrangement by which empty cars should be sent from the destination to the originating road to match loaded cars received,[9] or the filing of these Rules with the Interstate Commerce Commission as a tariff.

Believing that any difficulty in the past arising from the maintenance of equity between roads with respect to car supply and ownership is due not so much to the Car Service Rules as to the non-observance of these Rules, the railroads have agreed to delegate to the Car Service Division plenary powers for supervising the application of the Car Service and Per Diem Rules and for suspending Car Service Rules 1 to 5, inclusive, when necessary.

In exercising these powers, the Car Service Division has taken the following steps:

(1) Beginning in 1923, all carriers were required to report every month the observance and violations of the Car Service Rules. The report shows:

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[7] See references to Chapter IX.

[8] A special committee appointed by the American Railway Association to devise a formula of car ownership held that a general formula could not be devised to meet all circumstances. Preliminary and final reports of the committee, October 24, 1921, and June 1, 1923.

[9] A general equalization arrangement was put into effect on all roads from October, 1920 to July, 1921, and was governed by the Regulations of Equalization prescribed by the Car Service Division. Although this arrangement would result in a faster return of cars to the owners, it fails to permit cars to follow the natural flow of traffic, fails to take care of a situation when the accumulation of cars in the destination territory is diminished, and fails to assure equity between loaded and empty car mileage. It could not be applied generally, and was abolished on July 1, 1921, and the old "home route rights" principle was again adopted.

(a) Foreign cars, box and open-top, loaded.

(b) Foreign cars, box and open-top, loaded in violation of the Car Service Rules.

(c) Per cent of violation in foreign car loadings.

(d) Cars, box and open-top, handled contrary to Junction Rule 2.

(e) System cars, box and open-top, loaded.

(f) System cars, box and open-top, loaded to off-line points.

(2) A number of Car Service Agents are employed to inspect on the ground the observance of the Car Service Rules.

(3) Appeals are made to the railroads to educate their station agents, yard masters, and car distributors as to the necessity of observing the Car Service Rules.

(4) The shipping public is similarly requested to load cars in accordance with the Car Service Rules, to order cars for shipments as much in advance as possible, to specify the full routing, and not to reload empty cars at plants contrary to these Rules.[10]

The Car Service Division has also exercised its power of suspending Car Service Rules 1 to 5, inclusive. The notable examples are the prohibition of local movement on Eastern roads of box cars belonging to Western roads in an opposite direction to the home roads as is permitted by Rule 2 (b) and (c), and 3 (c); the prohibition of the return of Eastern box cars empty on Western roads; and the prohibition of the loading on foreign roads of coal cars belonging to several roads in the Pocahontas Region.

On account of the active supervision by the Car Service Division, particularly since the adoption of the railroad program of 1923, the Car Service Rules have been better observed even in times of an urgent demand for cars. Reports to the Car Service Division show a steady improvement of the observation

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[10] Car Service Division: Circulars to the shipping public, March 31, 1922, October 19, 1923, and April 1, 1926.

of these Rules,[11] and it is felt that this improvement has been partly responsible for the fact that the railroads have been able to handle unprecedented traffic without a serious car shortage in the past two or three years.

The Car Service Rules are filed with the Interstate Commerce Commission, not as a tariff as is frequently proposed, but in accordance with the provisions of the Transportation Act of 1920, which require the filing of rules and regulations with respect to car service, and authorize the Commission to suspend any of the rules and regulations and to establish other rules and regulations in case of necessity. During the periods of car shortage in 1920 and 1922, the Commission issued car service orders directing the movement of cars, but set aside the Car Service Rules only to the extent that they were in conflict with its orders.

The Car Service Division is not only authorized to supervise the application of the Car Service Rules but also empowered to transfer cars from one road or territory to another in order to meet any emergency. Past experience shows that when there is a general car shortage, a car surplus is often found in some portion of the country, and conversely, when there is a general car surplus, a car shortage may be found on some roads. This represents an uneven distribution of cars between roads. For example, car surpluses and shortages appeared at the same time in 1916, 1917, and 1918, as shown on Chart I. Since 1919, an

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[11] The record of the observance of the Car Service Rules from May, 1923, to December, 1925, is as follows:*

	1923 (8 MONTHS)	1924	1925
Total foreign box cars used properly	79.1%	79.2%	82.3%
Total foreign open-top cars used properly	82.9%	84.2	84.8
Total foreign box and open-top cars used properly	79.9	81.9	82.4

	1923 (8 MONTHS)	1924	1925
System box cars loaded	3,997,826	9,765,840	13,119,950
System box cars loaded off-line	15.1%	18.4%	21.3%

* Report of the Car Service Division to the Board of Directors of the American Railway Association, May 19, 1926, p. 15.

improvement in this respect has been made, reflecting a more even distribution of cars than was obtained in previous years.

The necessity of transferring cars from one road or territory to another may be caused by one of the following factors:

(1) Some roads are adequately equipped in proportion to the volume of traffic originating on their lines, and others are not.

(2) Some roads, although adequately equipped, may be deprived of the use of their equipment by those roads which are under-equipped.

(3) In a continental country like the United States, economic interests in different sections are greatly diversified. A sectional business boom may cause a sectional transportation shortage. For instance, during the phenomenal business boom in Florida in 1925, the railroads serving that section could not meet all the demands of traffic moving into Florida; and the unprecedented winter wheat movement in the Southwest in 1926 taxed the full capacity of the Southwestern railroads.

(4) Considering the huge task of distributing almost two and a half million freight cars to a vast number of shippers exactly where and when they are needed, it may be said that car shortages local in scope and confined to a short period in the fall are unavoidable.

The territorial adjustment of car surplus and shortage constitutes a real problem. An individual road is not vitally interested in any car shortage on other lines except possibly its immediate connections, nor is it under obligation to assist others. However, the railroads have voluntarily agreed to authorize the Car Service Division to transfer cars from one road to another with due regard to both car ownership and traffic requirements. The Interstate Commerce Commission also has power to direct the supply, distribution, and movement of cars between roads under the authority of the Transportation Act of 1920.

It is clear from the foregoing discussions that the underlying task of the Car Service Division is, first, to maintain a satisfactory car supply between roads as far as possible to the extent of their respective car ownership, and second, if their car ownership fails to take care of their traffic demands, to mobilize cars from those roads which met their own traffic requirements and are still in a

position to give assistance. To do these two things, the Car Service Division must have full knowledge of the current situation of car surplus and shortage and the location of both system and foreign cars. It has, therefore, inaugurated a system of reports of car supply and distribution as follows:

(1) A weekly report of average daily revenue freight car surpluses and shortages shows the car surplus or deficiency by classes, and the number of cars stored for special or future loading. The average daily car surplus is obtained by dividing total empty serviceable cars on hand in excess of shippers' orders by the number of working days during the period of the report; the average daily car shortage by dividing total car shortages during the period by the number of working days. Cars stored for special loading such as grain, perishables, etc., are reported as surplus, but with a note stating the number and for what purpose they are stored.

(2) A semi-monthly revenue freight car location summary gives the number of cars by classes, owned or leased, home cars on home roads, total cars on line, and per cent of cars supplied on loading orders. The last named is obtained by dividing the average daily number of cars supplied by the average daily loading or shipping requirements (that is, the actual ability of the consignor to produce, load, and ship). Dividing home cars on home roads by total cars owned gives the percentage of home cars on home roads, and dividing total cars on line by total cars owned shows the percentage of cars on line, both of which are important factors of control of car supply and distribution. The latter indicates whether the car supply on various roads is excessive or deficient, and the former reveals the extent to which cars used in inter-line traffic are returned to the owners.

(3) A semi-monthly statement of foreign freight cars on line shows the number of foreign cars by classes on line.

REFERENCES TO CHAPTER IV

American Railway Association:

Codes of Rules: Car Service, Per Diem, Interchange or Master Car Builders' and Switching Reclaims.

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Original and amended forms of Per Diem Rules in effect from July 1, 1902, to September 1, 1923.

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See also references to Chapter IX.

Chapter V

Control of Freight Car Supply and Distribution: Major Problems

The control of freight car supply and distribution on and between the railroads by the Car Service Division is of a general nature, and is concerned only with a few major problems. The Division takes direct control of car supply and distribution in three different cases:

(1) On the request of one or more railroads. Whenever one road finds that it has not an adequate car supply to meet its traffic demands, it will, first of all, call on its immediate connections for assistance either by promptly returning its own cars or by delivering cars belonging to the connections for its use. Later the road may find it necessary to call for the assistance of its direct and indirect connections through the District Managers of the Car Service Division who are charged with taking care of local problems. Finally, it may appeal to the Car Service Division at Washington, D. C., to handle the situation.

(2) On the complaint as to car supply and transportation service by the shippers to the Car Service Division or the Interstate Commerce Commission.

(3) On its own initiative to correct or improve certain conditions.

The Car Service Division is only concerned directly with the problems of box car supply and distribution in relation to the transportation of Western grains, refrigerator car supply and distribution in relation to the transportation of perishables from the Pacific Coast and the Southeast, and open-top car supply and distribution in relation to the transportation of coal. How the Division has attended to these three problems is discussed in this chapter.

Box cars are the most numerous and the most commonly used type of freight cars in the United States. They numbered 1,078,000 out of a total ownership of 2,357,000 cars on Class I

roads in 1925. Box cars are used to transport commodities which must be protected against weather, such as agricultural products, lumber, manufactured articles, and merchandise. However, it is not the problem of box car supply and distribution in general but their relation to the transportation of Western grain that constitutes the most difficult transportation problem in this country. Prior to 1923, there was a regular, seasonal car shortage on Western roads during the season of the grain movement, and the Car Service Division, ever since its organization, has been chiefly concerned with this problem.

The railroads serving an agricultural district have generally a more difficult task than those serving coal mines or manufacturing industries. Crops are raised on farms and are moved from farms to country elevators and from there to markets whereas coal and manufactured articles are shipped from certain more or less definite localities. Furthermore, crops must be away from farms promptly to avoid damage by adverse weather, and therefore, the movement of crops is confined to the few fall months following the harvest. In order to handle satisfactorily this seasonal crop movement, the Western roads must gather an adequate box car supply in the loading territory in advance of the harvest.

During the period of crop movement, it is always very difficult to maintain an adequate box car supply on Western roads. First, box cars are in universal use in all parts of the country although the principal traffic for which they are provided differs in different sections. To a certain extent, all box cars are similar, but many box cars that are entirely suitable for manufactured articles, lumber, or merchandise are unsatisfactory for grains, which must be shipped in cars of rigid construction and absolutely of no broken lining and defective sides or ends. Second, the shipment of Western grains to Eastern and Southern markets or for export sends many Western box cars away to Eastern and Southern roads. If those Western box cars are not promptly returned, they are apt to be scattered and used in other traffic not requiring that type of cars, thus causing a box car shortage on Western roads. Therefore, it is very essential that all Western box cars moving out of Western roads must be returned

promptly and continuously throughout the year, regardless of a box car surplus or shortage on Western roads.

The Car Service Division watches very closely the current situation of box car supply on Western roads. The percentage of box cars on line and the percentage of home cars on home roads, both of which are available from the semi-monthly car location report, indicate whether their current box car supply is satisfactory or not. In addition, the Car Service Division receives a box car passing report showing the number of both loaded and empty box cars moved East- and West-bound through certain important gateways, such as Chicago, St. Louis, etc. This passing report reveals the number of box cars returned from Eastern and Southern to Western roads and also enables the Car Service Division to take direct control of the despatching of box cars at the gateways if an emergency arises on any Western road.

Before and during the movement of Western grains every year, the Car Service Division has found it necessary to call the attention of Eastern and Southern roads to the transportation needs of Western roads and to the necessity of promptly returning Western box cars according to the Car Service Rules. The observance of Junction Rule 2, which requires that foreign cars empty at the junction with the owner must be returned at that point empty, is particularly emphasized. It has also urged Western roads to use foreign cars for off-line loading to the greatest possible extent and to hold their own cars for grain movement. If these two appeals are not heeded, it has found it necessary to protect the car supply of Western roads in one of the following ways:

(1) By suspending Car Service Rules 1 to 5, inclusive. As a result of the great car shortage in 1922-1923, Western box cars were scattered all over the country, and the percentage of box cars on Western roads was very low. For the purpose of protecting the seasonal grain movement in 1923, the Car Service Division issued orders in April, 1923, requiring that Eastern and Southern roads should promptly return Western box cars and that they were prohibited from moving locally empty Western

box cars in an opposite direction to the home roads as is permitted by Car Service Rules 2 (b) and (c) and 3 (c).[1]

In 1924 the box car supply on Western roads was satisfactory. But for the purpose of intensifying the observance of the Car Service Rules, orders were issued prohibiting Western roads from sending Eastern and Southern box cars, and Southern roads from sending Eastern box cars, home empty except automobile and ventilated cars and cars released at junction points.[2]

(2) By transferring cars from one road to another by the consent of roads concerned. During the car shortage in 1920, the Car Service Division issued orders not only relocating Western box cars but also transferring Eastern and Southern box cars to Western roads.[3] In other words, cars were handled without regard to ownership. Again, during the heavy movement of winter wheat in the Southwest in 1926, the Car Service Division first arranged an equalization plan between roads north and south of Fort Worth, Texas, by which deliveries of loaded grain cars were matched by return of empty cars in condition for grain loading.[4] Then, it took control of the despatching of box cars at Chicago and diverted to one road in the Southwest all available empty cars fit for grain loading, regardless of ownership.[5]

In addition to the problem of maintaining an adequate box car supply on Western roads, there is another factor affecting the successful movement of Western grains, namely, the receiving capacity of railroad terminals and public and private elevators, which will be discussed in Chapter VI in connection with the control of traffic movements.

There are three types of refrigerator cars used by the railroads for the transportation of perishable products. One is used to ship fresh meats requiring low temperature and no ventilation; another, equipped with ice bunkers and ventilators, is suitable under refrigeration or ventilation for all perishables other than

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[1] Car Service Division: Box Order One, April 15, 1923.
[2] Car Service Division: Box Order One, November 1, 1924, and Box Order Three, November 10, 1924.
[3] Car Service Division: A memorandum of box car distribution, August, 1923.
[4] Car Service Division: Order, June 25–July 30, 1926.
[5] Car Service Division: Order, July 8–18, 1926.

fresh meats; and still another is insulated but without refrigeration or ventilation and is used to ship ice or beer. The first type is used exclusively by the meat-packing industry. Large packing companies furnish their own refrigerator cars so that the railroads only supply a small portion of refrigerator cars to the small companies. The problem of the transportation of perishables is confined to that of fresh fruits and vegetables requiring refrigeration or ventilation.

The production and distribution of fresh fruits and vegetables has become a highly specialized industry of national proportions. Their abnormal growth from 500,000 carlots in 1918 to 900,000 in 1925 according to the U. S. Department of Agriculture, their centralized production on the Pacific Coast and in the Southeast with the chief markets in the territory east of Chicago, causing a long haul from the producing to the consuming territory, and the concentration of their transportation within a short period of the year all these have caused during the peak movement car shortages at shipping points, congestion at railroad terminals and markets, retention of refrigerator cars by receivers, and depression of prices to growers because of the over-crowding of products at markets.[6] The railroads, moreover, have found it financially difficult to provide an adequate supply of refrigerator cars to take care of all of the perishable freight during the peak movement, for these cars would necessarily be idle for the greater part of the year.

In the territories producing large quantities of fresh fruits and vegetables in the United States, private refrigerator car lines have been organized by the railroads under contract to furnish refrigerator cars to the shippers. For example, the California territory is served by the Pacific Fruit Express controlled by the Union Pacific Railroad and the Southern Pacific Railroad, and by the Santa Fe Refrigerator Despatch controlled by the Atchison, Topeka, and Santa Fe Railroad; the Southeastern territory and a part of Michigan is served by the Fruit

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[6] The problems of the transportation of perishables are discussed in detail by the U. S. Department of Commerce in "Transportation of Pacific Coast Perishables," 1924.

Growers' Express controlled by a number of railroads in the East and the South; the Southwestern territory is served by the American Refrigerator Transit controlled by several roads in the Southwest; and the Northwestern territory is served by the Western Fruit Express controlled by the Great Northern Railway.

The general schemes of control of refrigerator car supply and distribution by those private car lines may be briefly stated here. All leased and owned cars are distributed on and between contract roads according to loading requirements instead of on the basis of ownership, thereby considerably increasing the availability of equipment in service. Estimates of loading requirements at all shipping stations on contract roads are made periodically by local agents. Interchange of equipment has also been arranged between the Fruit Growers' Express and the Western Fruit Express, the Pacific Fruit Express and the Santa Fe Refrigerator Despatch so that cars can be transferred from one territory to another. As the peak perishable movement from the Pacific Coast takes place in September, October, and November, and that from the Southeast in May, June, and July, these interchange arrangements have brought about a better distribution and use of refrigerator cars, and have effected a more efficient and economical handling of perishables.

The Refrigerator Department of the Car Service Division with office at Chicago takes charge of the location, relocation, and distribution of refrigerator cars. The Refrigerator Department was established in July 1918, as a part of the organization of the Car Service Section of the U. S. Railroad Administration, and its function was to control all the refrigerator cars owned by railroads or privately, which were then pooled. After the termination of the federal control of railroads, the refrigerator car pool was dissolved. Under Per Diem Rule 19, the Refrigerator Department still has control over railroad-owned refrigerator cars, but it has no authority over private car lines although they usually co-operate with one another. Both private car lines and railroads that still furnish their own refrigerator cars report to the Refrigerator Department their current refrigerator car supply. A bi-monthly report shows the number of refrigerator

cars on hand, loaded, and empty, and total owned while a daily report gives the number of refrigerator cars ordered, available, and loaded.

One of the most interesting methods developed by the Car Service Division for controlling car supply and distribution is the so-called California Grape Car Plan. On account of the enormous growth of grapes in California and the concentration of their shipments to Eastern markets in a short period of the fall, the railroads serving California were unable to meet the demand of all grape shippers in 1923, 1924, and 1925. While they had no knowledge of actual grape car requirements until ordered, the shippers' car orders were uniformly inflated beyond their ability to pack and load.[7] At the request of the railroads in California, the Car Service Division undertook to handle the grape movement in 1926. By co-operating with the Pacific Coast Shippers' Advisory Board, the Interstate Commerce Commission, and other federal and state authorities, a grape car distribution plan was adopted by both circular and tariff, effective from August 15 to December 31, 1926. The plan[8] provided in substance that all grape shippers must guarantee freight charges and file a joint surety grape bond, executed by a bonding company, authorized to do business under the laws of California; that all shippers must file a statement of approximate weekly car requirements ten days in advance of each weekly shipping period; and that cars would be distributed during the period of shortage on a basis of car requirements which had been filed and substantiated as to tonnage and approved by the joint railroad representative. The plan was executed by the Car Service Division as the joint railroad agency with headquarters at San Francisco. The state of California was divided into eight shipping districts, each with a representative of the Car Service Division. Co-operating with the Car Service Division were a Grape Car Plan Committee representing the railroads, and a special committee representing the Pacific Coast Shippers'

[7] Car Service Division: report to the Board of Directors of the American Railway Association, September 24, 1926, pp. 16–17.

[8] Joint announcement of the California Grape Car Plan for 1926, June 18, 1926.

Advisory Board. In each shipping district, there was a public committee composed of growers, shippers, and bankers, which served in an advisory capacity.

The plan was a success. Grapes were moved in 1926 without a single day of car shortage.[9] The weekly statements of approximate car requirements gave a definite measure of the shippers' intended forwardings in advance of actual loading, thus enabling an opportunity for the promotion of a more even flow of grapes to markets. The surety bond permitted all shippers to forward grapes from any point on any railroad, thus allowing a greater flexibility of grape shipments at loading points. The plan was initiated as an experiment in the right direction, and may be amended from year to year to meet the transportation requirements of the grape industry.

Open-top cars, including hopper, gondola, mill-type, and flat cars, are used to ship coal, coke, ore, iron and steel, gravel, sand, stone, and other heavy products, but the provision of an adequate open-top car supply for the transportation of coal is the most important problem.[10] First, anthracite and bituminous coal together constitutes the predominant item of railway traffic. Second, due to the over-expansion of the bituminous coal industry during the War period from 5818 mines with total production of 416,000,000 tons in 1910 to 8921 mines with total production of 564,000,000 tons in 1920, an increase of 53 per cent in the number of mines and 36 per cent in production, the railroads became unable to meet its transportation demands. Third, the two periods of great car shortages in 1920 and 1922 were preceded by, and were the principal results of, labor strikes in the coal industry. Each mine strike curtailed coal production during the period of strike, resulting in a car surplus; but when the strike was settled, coal production was accelerated in an effort to recover from the suspension of mining, and consequently, the car surplus was transformed into a car shortage. Fourth, coal car orders were greatly inflated during the period of a

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[9] Advance report of the California Grape Car Plan, November 1, 1926.

[10] The problems of the transportation of coal are analysed in detail in the report of the American Railway Association with the Conference Committee of the U. S. Coal Commission, June 1, 1923.

threatened or actual car shortage, cars furnished being less than cars ordered, but at the same time in excess of cars loaded. Finally, the difficulty of coal transportation has been due partly to the irregular, seasonal demand for coal by consumers.

The Car Service Division supervises not only the location and re-location of coal cars on and between roads but also the actual distribution of same to mines. Because of the great expansion of the coal industry and the keen competition between various coal fields, the relative car supply to mines is a very important factor. All carriers are required to make a weekly open-top car report to the Car Service Division, showing open-top cars actually required, furnished, percentage furnished, loaded, and actually placed but not loaded. Another weekly report gives a more detailed information of the operation of coal mines, both anthracite and bituminous: cars required, placed, percentage furnished, explanation for not supplying maximum requirements (car shortage, labor troubles, specifying whether railroad or mine, other causes); cars loaded, explanation for not loading all cars placed; coal (in terms of cars) carried over daily unconsigned, explanation, and coal cars carried over daily at mines.

A mine ratings book is kept, giving the relative ratings of coal mines established by the railroads and the amount of coal shipment. This is to check the inflation of mine ratings.

The most difficult problem in connection with the transportation of coal is the maintenance of an adequate car supply on the several roads serving the Pocahontas Region. The demand for coal from the non-union mines in West Virginia and Kentucky has been greatly increased since the Jacksonville wage agreement became effective in union mines in Pennsylvania, Ohio, and other states in January, 1923. But a more important cause is that coal shipped by those roads is largely marketed on their connections, and consequently, their coal car supply is apt to be depleted during the heavy coal movement in the fall. As a measure of protection, the Car Service Division has undertaken to supervise the daily interchange of coal cars between those roads and their principal connections at important gateways. When more cars, loaded and empty, are delivered to than

received from their connections, those roads are losing cars through interchange. Immediate action will be taken to correct this situation by requiring the delinquent connections to make up their deficiency of deliveries. A more drastic step of protection was taken when an order was issued in September, 1924, prohibiting all coal cars belonging to those roads from being used for any loading whatever on foreign roads even in the direction of the home roads.[11] This order is a deviation from the Car Service Rules, but it has proven to be a very effective means of maintaining a satisfactory car supply on those roads, and is still in force. Finally, the Car Service Division is prepared to transfer cars from other roads. For example, during the anthracite strike from September, 1925, to February, 1926, the demand for bituminous coal was greatly increased, and there was a threatened car shortage on the Chesapeake and Ohio Railroad. Several thousand cars were shifted to that road from anthracite coal roads which had then a car surplus.

There are several other problems of car supply and distribution that the Car Service Division has to look after, one of which is the stock car supply on Western roads. There is generally a plentiful stock car supply on Western roads for the movement of live stock from ranches to markets in the Mid-west. In 1922 there was a serious stock car shortage in the Southwest, and the Car Service Division transferred stock cars from other territories to meet the emergency. The movement of live stock from the Mid-west to markets in the East has been greatly helped by the Eastern Railroads' Stock Car Pool at Union Stock Yard at Chicago.[12] Several principal Eastern roads have agreed to pool their stock car supply at Chicago under the direction of a pool controller. The controller orders from member roads of the pool stock cars necessary for their respective loading requirements, and in case any member road fails to furnish its quota, orders from members to make up the deficiency.

Another problem is the automobile car supply. The rapid growth and the concentration of the automobile industry in the states bordering Lake Michigan and the country-wide distribution

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[11] Car Service Division: Coal Order 411, September 23, 1924.

of automobiles have caused some difficulty in maintaining an adequate automobile car supply on the roads serving that territory. The Car Service Division has found it necessary to call the attention of all roads in the East, West, and South to promptly returning automobile cars to the automobile territory.

Still another important problem is the box car supply on Canadian railroads. The interchange of traffic between Canada and the United States has generally resulted in the accumulation of Canadian box cars in the United States. The Car Service Division has on hand current information of box cars interchanged between Canadian and American roads, and has handled the relocation of Canadian box cars much as it handled that of Western box cars in the United States.

Although one of the functions of the Car Service Division is to standardize rules and regulations concerning car service, including the distribution of cars to the shippers and the preparation of car records, little has been done. It has up to the present promulgated uniform mine-rating rules for all roads, CS 31, revised, in 1925, grain car distribution rules for the Northwestern roads in 1923, and saw-mill rating rules for the Southeastern roads in 1924.

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Transportation of Pacific Coast Perishables, 1924.

Florida Transportation Field Survey, 1926.

See also references to Chapter III.

[12] Memorandum of the Agreement of Certain Eastern Railroads for the Furnishing of Stock Cars at Chicago, February 1, 1925.

Chapter VI

Control of Traffic Movements

Another fundamental difficulty in the past has been the frequent accumulation of traffic at terminals and the resulting congestion. The extent of the accumulation of traffic may be measured by the number of loaded freight cars awaiting movement, and from Chart I, it may be seen that freight car accumulations have been reduced almost to the vanishing point since 1923. This improvement may be attributed primarily to the active control of traffic moving on and between the railroads by the Car Service Division.

Congestion of railroad terminals may be caused by the inadequate terminal capacity to receive cars, the shippers' disability to unload and release cars promptly, an abnormal flow of traffic moving into terminals, or other interferences with the normal flow of traffic, such as labor strikes.

It is generally agreed that railroad terminal facilities have not been increased in proportion with the rapid growth of traffic for some years, and it would indeed be financially difficult for an individual road to provide adequate terminal facilities in large cities where the value of real estate has become prohibitive. Nevertheless, the railroads are in favor of closed terminals, that is, the use of terminals reserved to the owners only, on the ground of competitive advantages. The problem of the operation of railroad terminals is the outstanding problem of railroad operation today.

The capacity of the shipping and receiving public to unload and release cars at destination is limited by public and private storage facilities. Cars are oftentimes held for storage purposes. In addition, cars may be held on account of shipments exceeding the absorbing capacity of the market, holding for higher prices, peddling from cars, or numerous reconsignments. Delays in unloading and reconsignments may also be caused by the fault of the carriers, although it is impossible to determine the alloca-

tion of responsibility for the detention of cars. It must also be admitted that an abnormal flow of traffic and labor strikes interfering with the normal flow of traffic are both beyond the control of either carriers or shippers.

In order to remedy terminal congestion or to prevent threatened congestion, it is necessary to control not only the inbound traffic moving into the terminal but also the outbound traffic at loading points. The Car Service Division has, therefore, undertaken not only the supervision of the movement of cars on all roads, the regulation of the issue of embargoes and permits, and appeals to the public for prompt loading and unloading, but also the development of an orderly flow of traffic from shipping points to markets or trans-shipment points.

First of all, the Car Service Division watches the current situation of car movement on the road as well as at terminals. A semi-weekly car movement report made by the carriers as of Wednesday and Saturday, shows the number of cars (loaded and empty) moved during the previous 24 hours, on hand to move, and the location of any accumulations together with weather and motive power conditions. The relative efficiency of car movement on various roads will be revealed by working out such factors as the maximum movement in 24 hours in former periods, percentage of maximum to current movement; percentage of empty cars moved to total moved; cars left over to be moved, percentage of cars left over to total moved, and the best previous performance. Then, a weekly revenue freight car accumulation report as of Friday shows the number of cars accumulated in greater number than can be handled or disposed of currently because of the inability of connections or consignees to accept, delays in reconsignments, unloading or forwarding, etc.

Whenever a railroad is threatened with congestion or any other interference with the normal flow of traffic at terminals or in areas involved, it is necessary to issue promptly an embargo against traffic movements until the volume of traffic awaiting delivery has been reduced to normal. The placing and handling of embargoes are governed by Per Diem Rule 16 and the regulations prescribed by the Car Service Division, revised, January 1, 1926, and are under the supervision of the Car Service Division.

An embargo may be complete or incomplete. An incomplete embargo exempts certain commodities which are necessary to meet the needs of the public, such as foodstuffs, live stock, coal, etc. Uniform exemptions are required and specified in the regulations prescribed by the Car Service Division. Permits may be issued to authorize certain individual shipments in order to give special transportation relief, but they must be so established that the shipping public will be protected against undue discrimination.

For the purpose of uniformity and to expedite the interchange of embargo information between various roads, the United States and Canada are divided into zones. The Car Service Division assigns the embargo zone chairman, and assigns primary roads to each zone and other than primary roads to primary roads for embargo purposes. An embargo is a temporary emergency measure. It is undesirable from any point of view, and yet it has proven to be a very effective means of reducing the accumulation of traffic and the congestion of terminals. It is a necessary evil which the carriers will withhold until the last moment.

The problem of controlling traffic movements, like that of controlling car supply and distribution, has several phases with which the Car Service Division is primarily concerned. They are the movements of grains, perishables, coal, and live stock.

The real limiting factor for the successful movement of Western grains from farms to markets is the railroad track capacity and the elevator storage capacity at primary markets or seaports. Grain movement must be so regulated as to keep railroad tracks and grain elevators within their working capacity. If grain receipts at primary markets or seaports, that is, grains on tracks and in elevators, exceed their working capacity, tracks will be congested and elevators blocked. No more inbound grains should be allowed until tracks and elevators are again in normal working condition. The Car Service Division receives a weekly report from the Chicago Board of Trade, giving the visible supply of grains in public and private warehouses at the principal grain centres; bushels of grains in elevators and the storage and working capacity of elevators. The railroads report to the Car

Service Division every week the grain movement situation at primary and export markets; grain cars on hand (in elevators and on tracks), received, loaded, reconsigned, and unloaded, and in addition, the deliveries to boats at export markets.

The practical co-operation of the shipping and receiving public has been successfully solicited in controlling the grain movement through the organization of the joint terminal grain committees composed of both shippers and carriers. In 1924 the grain crop in the Northwest was the largest in its history. The machinery of the Northwest Shippers' Advisory Board was brought into action, and a joint terminal grain committee was created to control the grain movement at terminals. This committee took three steps.[1] First, in order to relieve the congestion at Minneapolis, St. Paul, and Duluth, which are designated by the state of Minnesota as terminal markets to which grains may be consigned for sale, purchase, or storage, and where the federal and the state grain inspection and grading services are maintained, it was agreed that all grain cars should be held at some division points intermediate to Minneapolis long enough for inspection and sampling purposes. Second, as grain cars were held at outside sampling points from 2 to 4 days for an optional market, an embargo was issued against this holding privilege by refusing to accept shipments consigned to primary markets to stop at these sampling points. Third, as more carloads of grains were consigned to Duluth than its terminal facilities could handle, the committee explained to the Duluth Board of Trade the necessity of either increasing the unloading facilities or placing an embargo in order to avoid congestion; as a result, an embargo was issued against all grain shipments to Duluth.

A most remarkable result of the work of this committee was that while the issue of embargoes was the most drastic step ever taken in the Northwest, the country grain shippers realized that such action was in their interest and refrained from criticism against it.

Profiting by the successful experience of the joint terminal grain committee in the Northwest, the Car Service Division

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[1] Northwest Shippers' Advisory Board: report of the joint terminal grain committee, October 21, 1924.

co-operated with the Southwest Shippers' Advisory Board during the heavy grain movement in 1926, and organized many joint terminal committees at primary markets and seaports. As a result, cars were more promptly released and then returned to country loading stations, and there developed no difficulty in transportation.

The concentration in the marketing of perishables from the Pacific Coast at a few Eastern cities, and the larger growth of the traffic in relation to railroad terminal and market facilities for perishables have caused serious congestion at markets during the peak movement. The fundamental difficulty is the lack of systematic marketing and orderly movement of perishables. The Car Service Division has attempted to solve this problem by promoting an orderly flow of perishables from the shipping territory to markets by such means as the California Grape Car Plan already described in last Chapter, and the New York Grape Delivery Plan, and by expediting the unloading and release of refrigerator cars by receivers.

An important factor responsible for congestion at perishables terminals or markets is the delay in unloading and reconsignment, to meet which the Car Service Division has inaugurated a country-wide educational campaign for the prompt release of refrigerator cars by receivers.[2] During the seasonal perishable movement, special committees, composed of receivers of fresh fruits and vegetables and railroad representatives, are organized at all principal markets throughout the country for the sole purpose of expediting the release of refrigerator cars. Each railroad will report to these committees specific cases of delays, which will be taken up with the party responsible. This method has proven to be more effective than a general campaign. It has been suggested that if this principle of co-operation fails of its purpose, a penalty should be adopted, that is, a general track storage charge in addition to the ordinary demurrage

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[2] Gormley, M. J.: Refrigerator Car Delays, 1924.
During the four weeks of September and October, 1924, data compiled by the Car Service Division at principal markets in the country showed that out of 107,000 refrigerator cars released from load, 73,000 or 68.3 per cent were released in the free time, and 33,000 or 31.3 per cent were delayed beyond the free time.

should be imposed on cars held beyond the free time.[3] Then, of course, if refrigerator car detentions threaten to block the working capacity of terminals, a punitive measure might be resorted to such as the issue of embargoes against all grape shipments into New York City in 1923.

The problem of handling the grape shipments into New York City was a very difficult one. Formerly, when refrigerator cars loaded with grapes were delivered to receivers in New York City proper, that is, Manhattan Island, their detention was a common practice, resulting in the congestion of terminals in New York City and in their inability to receive further shipments from the West. Another difficulty was that the Erie railroad transported the larger part of the California perishables from Chicago to New York City while its terminal facilities and the receivers' unloading facilities in New York City invariably became inadequate to handle the peak shipment in the Fall. In 1924, the Car Service Division co-operated with the Atlantic States Shippers' Advisory Board and the Interstate Commerce Commission, and adopted the so-called Grape Delivery Plan. Under the plan, an embargo prohibits delivery of all juice grapes on Manhattan Island during the Fall, and instead they are delivered on the New Jersey side. It is also agreed that whenever the anticipated shipments of grapes to New York City exceed the capacity of the Erie railroad to handle, they should be diverted to other roads at Chicago. This plan has resulted in greatly reducing the refrigerator car delays in New York City, and has made possible the marketing of a larger amount of grapes than would have otherwise been possible.

To regulate successfully the heavy coal movement in the Fall and Winter every year, it is necessary to know the amout of coal stocks in the hands of consumers and dealers during the Summer. As coal is rarely stored at mines, consumers and dealers' stocks during the Summer furnish a good measure of coal production and shipments in the entire season, assuming that with certain allowances, the demand of coal is the same from

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[3] Car Service Division: Movement of refrigerator cars, *C. S. Bulletin 16*, June 18, 1924, in which remedies of refrigerator car delays were discussed.

year to year. The Bureau of Mines of the U. S. Department of the Interior makes a survey of coal stocks from time to time. On the basis of this information and the periodical reports of coal stocks from the railroads, the Car Service Division can make an estimate of the amount of coal to be shipped in the Fall and Winter.

Both railroads and coal operators have often appealed to the public to purchase and ship coal early in the season. Any advance shipment of coal in the summer will tend to equalize the demand for transportation between the four quarters of the year and stabilize the coal industry. Consumers and dealers, however, usually buy coal only when they need it and according to market conditions. They have no inclination to buy and ship coal early except in cases of necessity, such as a threatened coal strike or in localities remote from a coal supply. Unless some financial reward is given to consumers and dealers at least to cover the cost of storage,[4] it is extremely difficult to expect any appreciable response to the appeals of the railroads and coal operators. The Car Service Division has from time to time called the attention of carriers to the necessity of adopting a liberal program of coal storage,[5] and has also shown the public through the Regional Shippers' Advisory Boards the necessity of advance coal shipments.

The railroads serving the heavy coal producing fields in the Allegheny and Pocahontas Regions have developed two important channels by which large quantities of coal are moved in the summer. One is the Lake coal movement of coal from Eastern and Southern fields to Lake Erie ports, thence by boats to the Head of Lakes, and finally by rail to the Northwest which has no local coal supply; in return, iron ores are shipped from the Northwest to steel furnaces in Pittsburgh and the East, and grains to Eastern markets. Another is the Tidewater coal

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[4] Such as a cut of anthracite coal prices in the summer (A. T. Shurick: Coal Industry, 1924, pp. 202–203), or the establishment of seasonal coal freight rates (American Railway Association: Report to the Conference Committee of the U. S. Coal Commission, 1923, pp. 76–79).

[5] The question of coal storage by the railroads is discussed in detail by the American Railway Association: Report to the Conference Committee of the U. S. Coal Commission, pp. 67–75.

movement of coal to tidewater ports, thence by boats to New England, and finally by rail to the interior of New England, or to other ports in the United States or for export. Both of these channels have been efficiently developed as an aid rather than as a competitor to rail transportation, because, in addition to the advantages of advance shipments of coal in the summer, those roads taking coal to Lake Erie and Tidewater ports do not compete with those in the Northwest and New England which deliver coal to inland, but they compete with those taking coal by an all-rail route to the same markets. The quality of coal is also a factor.

As the coal supply in the Northwest and New England must be protected, the Car Service Division has carefully regulated the Lake and Tidewater coal movements. The Lakes are closed to navigation from early in December until the following April, and it is essential that from the beginning of the Lake season, the relative quotas of coal shipments in each week or month of the season should be accomplished. If coal shipments in the early season be withheld, the Lake season would be shortened, and the railroads would be over-burdened in the Fall. Such a situation existed in 1922, and the Interstate Commerce Commission was compelled to give priority in transportation to the Lake coal movement. The Car Service Division receives from the Ore and Coal Exchange of Cleveland, Ohio, which is a clearing house of all Lake coal shippers and carriers, weekly reports showing the number of cars of bituminous coal on hand at Lake Erie ports and dumped into vessels; the tonnage of bituminous coal dumped into vessels, and total tonnage dumped from the beginning of the Lake season to date. The Exchange also furnishes an estimate of coal required for the entire Lake season. A ratio of coal dumped to date compared with the total estimated dumping for the season will reveal how much coal is necessary during the rest of the season. Again, a comparison of the total dumping to date with that of the previous year or years will reveal whether the current Lake program is ahead or behind previous performance. It must be borne in mind that the movement of grains and ore from the Head of Lakes to Lake Erie ports is also a controlling factor of the Lake coal movement, as are ice conditions and vessel rates.

The Tidewater coal movement is regulated by the Car Service Division in a similar way to the Lake movement. Weekly statements are received from the carriers of tidewater coal, giving the number of cars of bituminous coal at certain principal gateways destined for New England by all-rail routes, received, forwarded, and on hand to move; the number of cars of bituminous coal to New England via tidewater ports on hand and dumped; the number of cars of anthracite coal to New England by all-rail routes, received, forwarded and on hand to move at certain principal gateways. By comparing the number of cars of bituminous or anthracite coal forwarded to New England at the gateways from January 1 up to date with the average number of cars forwarded in previous years, it can be seen how far coal shipments to New England are accomplished or are ahead or behind previous performance.

In both the Lake and Tidewater coal movements, railroad cars are often detained at trans-shipment points to wait for vessels and to clear dumping, thereby not only reducing the availability of equipment but also causing congestion at water-front terminals. As a means of conserving transportation facilities and speeding up the coal movement, all coal shipments at Lake and Tidewater ports were pooled during the War period under the supervision of the Lake Erie and Tidewater Coal Exchanges.[6] These Exchanges served as a clearing house and prepared complete information as to the number of cars loaded with Lake or Tidewater coal by all roads concerned, cars enroute to or at ports, and vessel movements. The Lake Erie Exchange has been continued in operation ever since its formation in 1916. On account of the enormous Lake coal movement, the short Lake season, the fact that the Lake coal is drawn from many fields, the number of carriers involved, and the necessity of receiving a heavy tonnage of iron ores in return, the railroads have agreed to continue the operation of the Exchange which is located at Cleveland, Ohio. The Tidewater Coal Exchange was organized in 1917, but ceased to function in 1919. The coal

[6] On the subject of coal pooling for water shipments, see the report of the American Railway Association to the Conference Committee of the U. S. Coal Commission, pp. 44–45.

operators on the Chesapeake and Ohio Railroad, however, and the coal trans-shippers using the port of Newport News, formed the Newport News Coal Exchange in 1920. The operation of this exchange has enabled that road to handle its tidewater coal traffic in approximately 50 per cent of the consignments that would be necessary if all the coal was handled in individual shipments.

Live stock producers and shippers are accustomed to ship and deliver their live stock to markets on Mondays, thus causing a weekly peak load, and in turn, a greater demand of stock cars at loading stations and congestion at markets. With the view of promoting a more orderly flow of sheep to markets in the Centralwestern territory, the Car Service Division co-operated with the Centralwestern Shippers' Advisory Board in 1924, and adopted a plan, whereby daily sheep receipts at primary markets and advanced car orders were broadcast to the public so that the shippers could adjust their shipments accordingly. A similar plan was worked out for the movement of ranch cattle into the Denver market in 1925. Both plans have not only helped solve the problem of stock car supply, but also have stabilized stock prices to the farmers.

When a railroad terminal is congested or is threatened with congestion, it is necessary not only to control the traffic moving into the terminal, but also to make an equitable distribution among the receivers of all available transportation facilities in the terminal. The so-called Florida Plan involved both features. Due to a business boom in 1925, traffic moving into Florida grew so rapidly that the railroads serving Florida could not handle it. Enormous quantities of materials of every description were consigned from all parts of the country to Florida, on the assumption that there was a wide-open market there, and regardless of whether or not previous consignments had been sold. As a result, cars were held on railroad tracks, and even when all available track space was occupied, there were still to the north of the Florida gateways, which had already been blocked, thousands of cars awaiting movement into Florida.

A definite control of the volume of inbound traffic was brought about by a state-wide embargo issued in October, 1925, applying

to all carload commodities except foodstuffs. The Car Service Division appealed to all shippers in different sections of the country through the Regional Shippers' Advisory Boards to refrain from shipping freight into Florida, and also organized the Florida Division of the Southeast Shippers' Advisory Board to bring about an equitable division of all available transportation facilities in Florida. The entire state of Florida was divided into a number of districts. In each district there was established a terminal district committee, and under which many terminal district receiving commodity committees. Each terminal district receiving commodity committee, representing those interested in the inbound movement of a particular commodity, would analyze currently the approximate number of carloads of that commodity to be received within that district. Then, the terminal district committee, composed of the chairmen of the terminal district receiving commodity committees, would compile the number of carloads of all commodities to be received within that district. Finally, an aproximate number of carloads of all commodities to be received in all districts in Florida could be arrived at. On the basis of this information, all available transportation facilities in Florida could be equitably divided among all receivers of freight on a percentage distribution. For example, if a certain district called for, say, 8000 cars and the railroads could handle only 6000 cars, 25 per cent of the receivers' requirements could not be met, and permits would be issued covering 75 per cent of the requirements of each district and each receiver. If a receiver applied for a permit and he still had cars on hand to be unloaded, his application would be denied and his next month's requirements would be reduced to the basis of what he had been able to unload during the previous month.

The Florida plan was put in operation in January, 1926. In the Spring of 1926, however, car accumulations began to disappear, and the situation came under control so that the plan did not undergo a full test. In principle, the plan was very similar to the California Grape Car Plan, except that the former was designed to meet a transportation shortage at the receiving point, and the latter, at the shipping point. Both are new in the history of the American railroads, and they will no doubt serve

as a future guide to handle any similar emergency which may arise elsewhere in the country.

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See also references to Chapter V.

Chapter VII

Control of Freight Car Performance

The chief factor in determining freight car supply is the number of cars owned by the railroads in condition for service, but it is also affected by the speed of car movement, the percentage of empty to total car mileage, and the extent to which the car-carrying capacity is utilized. The speed of car movement is measured by the average miles per car per day, which is obtained by dividing total car miles by cars on line daily, including those idle or surplus, those in shop for repairs, and those in the hands of the public for loading and unloading. The average tons per loaded car gauge the extent to which car capacity is utilized, and is obtained by dividing total ton-miles by loaded car miles. This chapter discusses only the methods employed by the Car Service Division for the improvement of car performance in both loading and movement.

The average miles per car per day on American railroads is generally a little below 30, being 25.1 in 1920 and 28.3 in 1925 on Class I roads. The gradual improvement in the speed of car movement is shown in Chart II. It must be borne in mind that this represents an average mileage made each calendar day by all cars on line, and that the actual speed of movement of loaded cars is always much higher.

Three important factors affect the speed of car movement: the time consumed by the public in loading and unloading, the time consumed by the carrier in yard service, including movements to and from loading and unloading points, repair tracks, and placing on road trains, and the time consumed by the carrier in road movement, including intermediate classification yard service. There is a general agreement between the railroad men that the time consumed by an average car on the road is very insignificant in comparison with that in the terminal and

intermediate yard and for loading and unloading.[1] The Car Service Division has from time to time urged the carriers to increase the speed of movement of both loaded and empty cars, and has also undertaken an active campaign to educate the shipping and receiving public to the necessity of the prompt loading and unloading of cars. By co-operating with the Regional Shippers' Advisory Boards in controlling traffic movements at both shipping and receiving points, the Car Service Division has succeeded in bringing about a more prompt release of cars by receivers and a speedier turn-around of cars to the loading territory. That cars have been more promptly loaded and unloaded is attested by the fact that Class I roads collected $30,505,039 in demurrage in 1920, but only $20,391,640 in 1925, a decrease of 33 per cent. This good result has been somewhat influenced by the increasingly dependable transportation service and the absence of a car shortage or congestion, so that stocks at destination have been reduced and cars unloaded more promptly on arrival.

Another factor determining the efficiency of car movement is the empty mileage. The percentage of empty to total car mileage is well over 30, as shown on Chart II. In other words, a loaded car moved for 100 miles must be moved at least 42.8 miles empty. This empty mileage is largely caused by the

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[1] According to Mr. W. H. Finley, President of the Chicago and Northwestern Railway, a typical trip of a freight car consumed 20.79 days but only 1.72 days on trains in 1922 (an address at the Mid-west Shippers' Advisory Board, October 15, 1924). Then, according to Mr. L. F. Loree, President of the Delaware and Hudson Railroad, the time of an average freight car trip is distributed as follows:

	DAYS
Road Movement	1.49
Delay in road movement	.15
Movement to and delay in interchange tracks	2.48
Movement through intermediate yards	1.55
Movement to and delay on storage tracks	.75
Movement to and delay on repair tracks	1.34
Movement for loading and unloading	1.74
Loading and unloading	4.00
Reconsignment, hold to order, etc	.50
Delay because of Sundays and holidays	.90
Total	14.90

(From "Railroad Freight Transportation", 1922, p. 263).

necessary relocation of empty cars to loading points.[2] The larger volume of traffic moving East- and North-bound than West- and South-bound demands a continuous movement of empty cars from the consuming to the producing territory. The shipment of one-way commodities such as coal, live stock, fruits and vegetables, and to some extent, grains and grain products, means an empty return of the cars handling them. Empty mileage is also caused partly by other factors such as freight accumulations or congestion, the physical condition of equipment, the effects of traffic via the Panama Canal, and the utilization of car capacity. That the relocation of cars to the owners according to the Car Service Rules is productive of empty mileage was mentioned in Chapter IV. This empty mileage is economically unnecessary. According to a study made by the Bureau of Railway Economics, Washington, D. C., out of a total of 8,569 million empty miles in 1923, 4,334 million were due to one-way traffic in which were included coal, iron ore, live stock, and tank cars, and fruits and vegetables, and automobiles; 3,699 million were due to unbalanced traffic, which figure was arrived at by assuming that any class of loaded cars Eastbound could be loaded back Westbound for any class of traffic and by getting the difference between the total East- and West-bound loaded car miles. In other words, 8,033 million empty miles or more than 93 per cent of the total in 1923 was economically necessary, and only 7 per cent might be considered as unnecessary.

In addition to the prompt loading and unloading of freight cars, the shipping and receiving public can also help the railroads in improving car performance by heavier car loading. It is the receiver who buys commodities, and it is the shipper who loads them into cars. Although the average carrying capacity of cars on Class I roads increased from 42.4 tons in 1920 to 44.8 in 1925, the average tons per loaded car decreased from 29.3 to 27.0. In other words, the percentage of car capacity utilization decreased from 69.1 to 60.4. This decrease in car loading

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[2] The causes of empty mileage are discussed in detail by the Car Service Division in "A Study of Empty Mileage", March 15, 1924.

was primarily due to the decrease of coal shipments and the increase of manufactured articles and L. C. L. freight.

The average load per car varies with the class of commodities, products of mines always constituting the heaviest loading commodities with forest products, manufactured and miscellaneous goods, agricultural products, and animal products making up the light-loading commodities in the order named. While the variation in the proportion of each class of traffic to the aggregate largely determines the fluctuation in the tons per loaded car, there are two other important factors. One is the long established small trade units and the failure of receivers to buy carloads of freight instead of the minimum carload weights as fixed by the Interstate Commerce Commission. Another is the lack of an impelling force of a car shortage during which periods cars are customarily loaded heavier than during periods of plentiful car supply.

The greatest opportunity for increasing the car loading lies in the solicitation of the voluntary co-operation of the shipping and receiving public. The Car Service Division has conducted an active campaign for heavier car loading through the Regional Shippers' Advisory Boards. The most effective method, however, is to call specific cases of light loading to the attention of individual shippers. Therefore, the Car Service Division has compiled an annual car loading statement from reports of commodity statistics made by the carriers to the Interstate Commerce Commission, showing tons per car of various commodities and giving the relative standing of efficiency, so far as tons per car is concerned, of all lines. This statement has been very valuable in dealing with railroad agents and officers as well as shippers by pointing out the necessity for heavier car loading. The railroad contact committees of the Regional Shippers' Advisory Boards also have prepared statements showing tons per car of those heavy loading commodities on various roads, and the shipping public is appealed to to show why the best performance of one road cannot be equaled by others.

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Chapter VIII

Regional Shippers' Advisory Boards: Origin, Organization and Activities

The success of the Car Service Division in soliciting the practical co-operation of the shipping and receiving public through the Regional Shippers' Advisory Boards has been notable. These Boards were born of the necessity for a medium of contact between production and consumption and transportation. During the War period and the federal control of railroads, it was a common practice for shippers to complain of car shortage or unsatisfactory transportation service to the Interstate Commerce Commission or to the various state commissions. After the termination of the federal control, there was an increasing tendency to turn to the government for an answer to all transportation problems. The Regional Shippers' Advisory Boards were formed primarily to avoid this practice.

The first Shippers' Advisory Board was established in the Northwest in January, 1923, to meet a distinct transportation emergency.[1] For many years prior to 1923, the Northwestern section of the United States had suffered from an annual car shortage and from congestion of grain elevators during the peak movement of grains. Then in 1922 occurred the greatest car shortage in history. Farmers and shippers were thoroughly embittered, and both the federal and state governments were urged to intervene. Under these conditions, the Northwest Shippers' Advisory Board was set up in January, 1923, as the result of a meeting at Minneapolis between the Northwestern railroads and the representatives of farmers' organizations, mill manufacturers, and bankers.

Immediately after its formation, the Board took three important steps to relieve the situation. First, the purpose of the Board was broadcast throughout the Northwestern territory,

[1] Reed, J. F. (Chairman of the Northwest Shippers' Advisory Board): Report to the joint conference of the Regional Shippers' Advisory Boards at Chicago, January 7–8, 1926, Proceedings, pp. 11–16.

and the public was asked to co-operate with the carriers. Second, the Board located every place that was entirely out of business because of elevators congested, and arranged with the railroads to give prompt car service to such place. Third, car supply and service complaints were taken up for adjustment by the Board in the order of their importance. At the same time, the Car Service Division directed the return of grain cars from the East to the Northwest. Within thirty days, the situation was under control.

The success of this experiment led the American Railway Association to announce, in connection with the railroad program adopted on April 5, 1923, an extensive movement to ensure the co-operation of shippers and carriers. To this end, the Car Service Division was directed to study the transportation needs of the different sections of the country and to form a shippers' advisory board in each section in which the economic and transportation problems were of a like kind. As a result, thirteen boards have been organized while the Florida Division of the Southeast Shippers' Advisory Board was set up in 1925 to meet the transportation problem in that region. The geographical assignments of these boards are shown on Map I.

The Regional Shippers' Advisory Boards deal with all questions of freight car service which come within the purview of the Car Service Division, all questions of rates and charges excepted. Their purposes are stated to be as follows:

(1) To form a common meeting ground between shippers and railroads, and the carriers as a whole as represented by the Car Service Division of the American Railway Association, for the better mutual understanding of local transportation requirements, to analyze transportation needs in its territory and to assist in anticipating car requirements.

(2) To study production, markets, distribution and trade channels of the commodities produced in its territory with a view to effecting improvements in trade practices as related to transportation, and to promoting a more even distribution of commodities, where practicable.

(3) To promote car and operating efficiency in connection with maximum loading, and in the proper handling of cars by shippers and railroads.

(4) To secure a proper understanding by the railroads of the transporta-

tion needs of shippers, and their co-operation in carrying out necessary rules governing car handling and distribution.

(5) To acquaint shippers and railroads in each section of the country with seasonal requirements in their section in order to promote intelligent co-operation in the handling of equipment between the different districts of the country.

(6) To adjust informally car difficulties which may arise in its territory between carriers and shippers.

(7) To give the shipping public a direct voice in the activities of the Car Service Division of the American Railway Association in all matters of mutual concern.

The Regional Shippers' Advisory Boards are voluntary public organizations, and all shippers, receivers, and financiers are invited to become members of these Boards in their own districts. Each Board has an executive committee and as many commodity and standing committees as are deemed necessary to make it thoroughly representative of the public. The executive committee is composed of a chairman, a vice-chairman, a secretary, an assistant secretary, and the chairman of the commodity and standing committee. Each commodity or standing committee has a chairman, a vice-chairman, and as many members as may be selected. All of the Board officers are elected by the members.

No railroads are members of these Boards. The channel through which each Board establishes relations with the carriers is provided by the railroad contact committee which is composed of the representatives of the carriers serving the district. The chairman of this committee is elected by the carriers' representatives, and the District Manager of the Car Service Division serves as its vice-chairman.

The headquarters of these Boards are located in the offices of the District Managers of the Car Service Division. Their main functions are performed at the regular quarterly meetings held at commercial centres within their respective districts, and their routine work is carried on by the staff of the District Managers. All expenses, including the printing of the proceedings of the Board meetings and the salary of the assistant secretary, are defrayed by the American Railway Association on behalf of the railroads. Other officers of the Boards receive no pay.

The most important activity of the Regional Shippers' Advisory Boards is to adjust informally all complaints or disputes as to car supply and transportation service. Rule 2 of the Rules of Procedure of these Boards provides that any complaint or dispute initiated by the shipper shall be handled by him individually with the carrier or carriers concerned; in case of failure, the commodity committee and the officers of the Boards may take it up with the railroad contact committee and the District Manager of the Car Service Division. The same process of negotiation will be applied to any complaint initiated by the carrier. This informal adjustment of service complaints has been, in so small degree, responsible for eliminating many complaints which would otherwise have been presented directly to the Interstate Commerce Commission, the state commissions, or the Car Service Division at Washington, D. C.

A second important activity of these Boards is to furnish reliable advance information as to transportation requirements. At the regular quarterly meetings, the chairmen of the commodity committees report the current situation of their particular lines of business, and submit estimates of cars required for loading in the following three months. Previously, questionnaires are sent to the members of the commodity committees, and the conclusions of the Boards are based on the replies.

These Boards also bring about a better understanding on the part of the public of the transportation problems of the railroads. At their meetings, the railroad contact committees report the current volume of car loadings, the ownership and physical condition of equipment, and the situation of transportation service on various roads. The District Managers of the Car Service Division report the general transportation situation within the districts, and the Chairman or one of the Managers of the Car Service Division at Washington, D. C., reports the general transportation situation throughout the country.

In addition, the Boards solicit the effective co-operation of the public in improving the transportation service. Shippers and receivers can help the railroads in many ways, such as by refraining from ordering more cars than they actually need in 24 hours, routing cars according to the Car Service Rules,

increasing the average loading of cars, reducing the time consumed in loading and unloading, etc. The success of the new methods adopted by the Car Service Division to control car supply and distribution, traffic movements, and car performance as described in the last several chapters, has been largely due to the public co-operation through these Boards.

Finally, these Boards establish a community of interest between shippers and carriers through personal contact at their meetings. In order to encourage the public attendance at the meetings of the Boards, special travelling arrangements are provided for, and the railroads send as many agents, superintendents, and other officers to the meetings as possible to enable them to get into closer touch with the public.

Although these Boards have been in existence only for a few years, the co-operative movement of shippers and carriers as represented by them has already achieved great success. There are two important reasons for this. One is the whole-hearted support of the members of these Boards, and the other is the favor accorded by public opinion to their activities. Nevertheless, these are the results rather than the causes, because the former is due to the personal force behind the co-operative movement, and the latter, to the publicity it has received. The staff of the Car Service Division and its district offices is selected not only from railroad men representing different sections of the country but also from the shippers themselves. The Car Service Division knows the problems of the carriers as well as of the shippers. The officers of these Boards are carefully selected so that they have the prestige and confidence of the shipping public in their respective districts. Co-operation between shippers and carriers has been given a great deal of publicity. Periodical transportation bulletins giving car loading, car ownership and physical condition, car surplus and shortage, car location and performance, are released to the press, the government regulatory bodies, and those interested. The proceedings of the meetings of the Boards are distributed to the public. For these reasons, the public has been better informed as to the improved transportation service of the railroads, and has been willing to co-operate with them.

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Chapter IX

Conclusions

The foregoing chapters have described the system of control of freight car service by the Car Service Division of the American Railway Association as the central agency of the railroads. The discussions may be summed up as follows:

(1) The Car Service Division was primarily the product of transportation emergencies, and even to this day its supervision of freight car supply, distribution and movement on and between the railroads is still of a general nature save in time of emergency.

(2) The supervision of freight car service has been decentralized through its district offices located in different sections of the country.

(3) It has developed such information of freight car requirements and supply as is necessary to the supervision of car supply and distribution.

(4) The Car Service Rules furnish the main basis of the handling of cars after leaving the owner's rails. The observance of these Rules has been carefully enforced although there is still room for improvement.

(5) It also takes charge of the territorial adjustment of car surplus and shortage with regard to both car ownership and traffic demands.

(6) The three problems of car supply and distribution with which the Car Service Division is most concerned are box car supply and distribution for the transportation of Western grains, refrigerator car supply and distribution for the transportation of perishables from the Pacific Coast and the Southeast, and open-top car supply and distribution for the transportation of coal.

(7) The Car Service Division has developed a definite system for the control of traffic movements in order to avoid or reduce congestion at terminals or on the road as well as to promote an orderly flow of traffic at shipping points.

(8) Much attention has been given to the increase of the speed of car movement and the heavier car loading.

(9) The practical co-operation of the public has been solicited in the execution of all plans of the Car Service Division through the Regional Shippers' Advisory Boards.

There are two outstanding principles upon which the system of control of freight car service by the Car Service Division has been based. One is the modified ownership principle on which freight cars are handled after leaving the home road; the other is that of the voluntary co-operation among carriers and between carriers and shippers and the government with respect to car service.

The Car Service Rules represent the ownership principle of car handling, but the present basis of car handling gives additional flexibility since the Car Service Division has been given power to suspend Car Service Rules 1 to 5, inclusive, if it proves necessary. This power has been repeatedly exercised, notably in Box Car Orders 2 and 3. A part of the Car Service Rules is not even based on rigid ownership, Rules 2 (b) and (c) and 3 (c) providing for local movement for foreign cars in an opposite direction to the owner. In addition, some roads have placed their refrigerator cars and stock cars in common use, disregarding ownership entirely.

Voluntary co-operation has been the keynote to the remarkable improvement of transportation service in recent years. The Car Service Division is a voluntary organization of the railroads to deal with all matters concerning car service. Since the adoption of the railroad program for the provision of adequate transportation on April 5, 1923, the railroads have adhered to a policy of co-operation on a large scale, and have continuously shown their co-operation actively with regard to the directions of the Car Service Division. The Regional Shippers' Advisory Boards represent public voluntary organizations through which shippers and carriers deal with all questions respecting transportation service. The Interstate Commerce Commission, instead of taking direct control of car service, has given its advice and co-operation to the Car Service Division, and has heartily endorsed the co-operative movement of shippers and carriers. Thus, all of the three parties—carriers, shippers and the Commission—have reached a broader and clearer

understanding of the transportation problems, and have adopted the principle of co-operation to solve them.

Some people, however, have questioned the effectiveness of the Car Service Rules and the voluntary organization of the Car Service Division in meeting the transportation requirements of the public, in protecting the investment of the car owners, and in promoting efficiency and economy in the handling of cars. This opinion is predicated on the assumption that the Car Service Rules would not be observed in times of car shortage, thereby causing unequal distribution of available cars among the roads and depriving some owners of the use of their cars; that in times of car surplus, the observance of these Rules would produce unnecessary empty mileage by returning empty cars to the owners even in the direction of the predominant traffic movement in order to avoid per diem charges; and that the mandatory orders of a voluntary organization like the Car Service Division would not be obeyed by all roads concerned. Therefore, a general or limited car pool is proposed, in which all or certain types of cars would be placed in common use without regard to ownership.

Although the car pool idea has been discussed for many years, the railroads have never unanimously agreed to adopt it. The only car pool officially authorized by the railroads was the Eastern Railroads' Coal Car Pool, organized in December, 1917, and terminated about March, 1920, although during the federal control of railroads, all cars were used without regard to ownership. Both the coal car pool and the federal control were the direct results of the War emergency. At the termination of the federal control, the railroads had under consideration both the pre-War rigid ownership plan and the pool plan, but could not agree on either. The modified ownership plan was adopted as a compromise.

The present system of control of car service by the Car Service Division, characterized by the principles of modified ownership and voluntary co-operation, has attained satisfactory results as the experience of the past years shows. The Car Service Division has built up an efficient organization. The observance of the Car Service Rules has been improved, reflecting a more

equitable distribution of cars between the carriers. Effective methods have been developed to control car supply and distribution, traffic movements, and car performance. The shipping public, which plays an important part in providing adequate transportation, has co-operated with the railroads through the various Shippers' Advisory Boards. The Interstate Commerce Commission, which is authorized by the Transportation Act of 1920 to direct car supply, distribution and movement in case of emergency, has also co-operated with the Car Service Division. It seems to the writer that the machinery of the Car Service Division will enable the railroads to meet any car shortage or transportation congestion which may arise on any road or in any territory throughout the country, and that the American shipping public will be thus assured of adequate transportation service to meet the growing commercial requirements.

REFERENCES

In February, 1922, the National Association of Owners of Railroad Securities submitted a proposal to the Interstate Commerce Commission for the fo mation of a freight car pool. This proposal received wide publicity particularly during the period of great car shortage and transportation congestion in 1922-1923. As a result, the facts of the ownership basis of car handling were scrupulously exposed. Some of the important papers relating to the proposal are very helpful to a thorough study of the subject of car handling and service. They are as follows:

National Association of Owners of Railroad Securities:

Proposal of the Board of Economics and Engineering for more serviceable and economical distribution and conservation of freight cars to the Interstate Commerce Commission, February 15, 1922.

Warfield, S. Davie (President). A Statement on the Car Pool Plan, July 10, 1923, and a letter to Daniel Willard, Chairman of a conference committee of the railroads, January 20, 1923.

Proceedings of the conference between the American Railway Association and the National Association of Owners of Railroad Securities, May 26, 1924.

American Railway Association:

Proceedings of the Sub-Committee appointed by the Committee on Car Service of the Transportation Division to report on the question of car pool, May, June and July, 1919.

Report of the special committee to devise a formula of car ownership, preliminary, October 24, 1921, and final, June 1, 1923.

Report of the committee analyzing the car pool plan of the National Association of Owners of Railroad Securities, February 1, 1923.

Analysis of an address of N. D. Ballantine at the New York Traffic Club, by the Car Service Division, September 25, 1923.

Proceedings of the committee to consider the Warfield Car Pool Plan at Richmond, Va., April 6, 1925, inluding statements of J. W. Roberts of the Pennsylvania R. R. and O. C. Castle of the Southern Pacific R. R. in favor of the Plan.

MAP I

JURISDICTION OF DISTRICT OFFICES OF THE CAR SERVICE DIVISION AND REGIONAL ADVISORY BOARDS

DISTRICT NO.	DISTRICT HEADQUARTERS LOCATION	REGIONAL ADVISORY BOARDS	DISTRICT NO.	DISTRICT HEADQUARTERS LOCATION	REGIONAL ADVISORY BOARDS
1	Chicago	MID-WEST	8	New York	ATLANTIC STATES
2	Detroit	GREAT LAKES	9	Pittsburgh	ALLEGHENY
3	Minneapolis	NORTHWEST	10	Omaha	CENTRALWEST
4	Cincinnati	OHIO VALLEY	11	San Francisco	PACIFIC COAST
5	St. Louis	TRANS-MO. KAN.	12	Boston	NEW ENGLVND
6	Birmingham	SOUTHEAST	13	Handled from Washington, D. C.	
7	Dallas	SOUTHWEST	14	Seattle	PACIFIC NORTHWEST

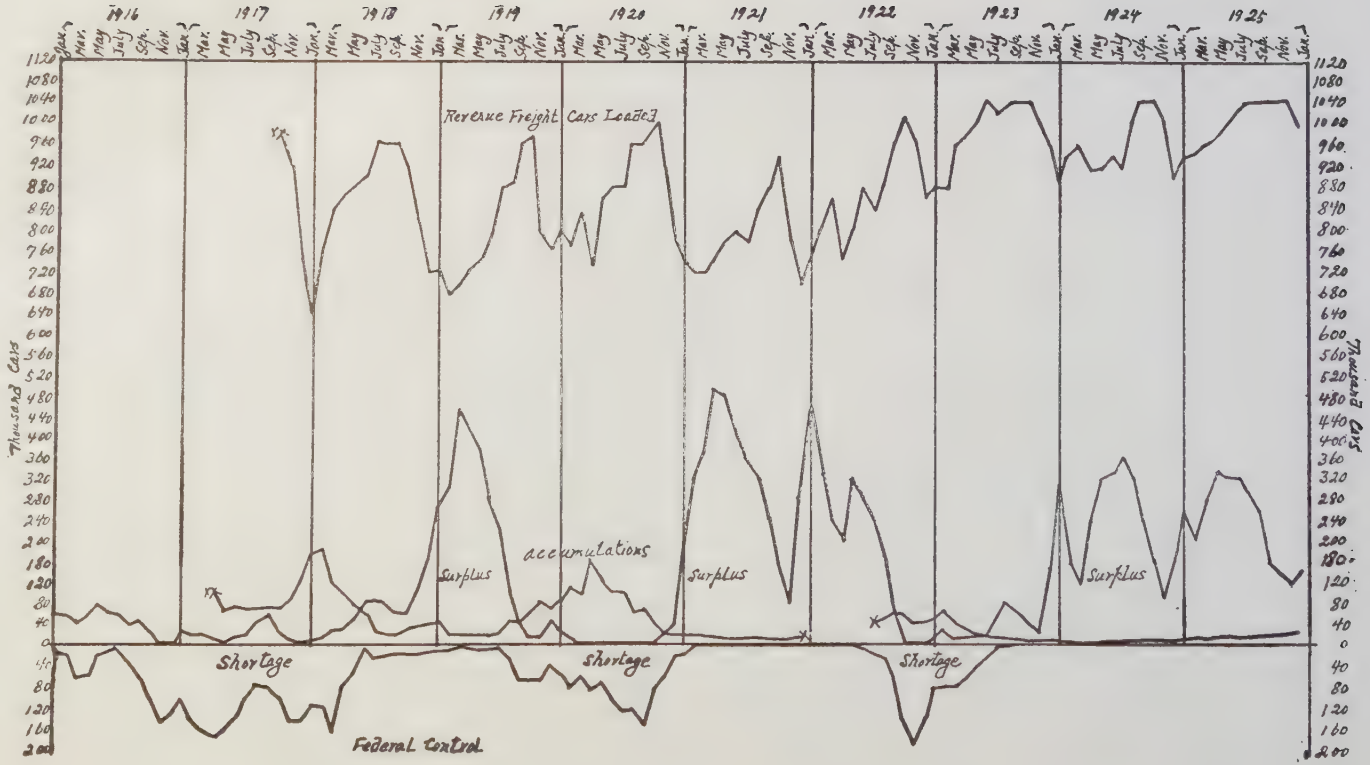
1916
1917
1918
1919
1920
1921
1922
1923
1924
1925
Revenue Freight Cars Loaded
Surplus
accumulations
Surplus
Surplus
Shortage
Shortage
Shortage
Federal Control.
Thousand Cars
Thousand Cars

TABLE I

RAILWAY FREIGHT TRAFFIC AND RAILWAY TRANSPORTATION FACILITIES ON ALL STEAM RAILROADS IN THE UNITED STATES FROM 1920 TO 1925.

YEAR ENDING DEC. 31	REVENUE FREIGHT CAR LOADINGS	REVENUE TON-MILES THOUSAND	PROPERTY INVESTMENT IN ROAD AND EQUIPMENT BOOK VALUE	MILES OF ROAD OWNED	MILES OF TRACKS OPERAT'D
1920	45,118,472	413,698,749	$19,849,319,946	252,845	406,579
1921	39,323,158	309,533,365	20,329,223,603	251,176	407,531
1922	43,207,561	342,187,536	20,580,168,269	250,413	409,359
1923	49,812,113	416,255,550	21,372,850,161	250,222	412,993
1924	48,534,433	391,945,037	22,182,267,385	250,156	415,028
1925	51,177,962	417,454,000	22,709,268,838	250,568	418,189

LOCOMOTIVES IN SERVICE		FREIGHT CARS IN SERVICE	
NO.	AV. TR. PR. LBS.	NO.	AV. CAR CAP. TONS
68,942	36,365	2,388,424	42.4
69,122	36,935	2,378,510	42.5
68,518	37,441	2,352,483	43.1
69,414	39,177	2,411,627	44.3
68,935	40,321	2,415,027	44.7

Source: I. C. C. annual report to the U. S. Congress in 1926.

CHART I.—Transportation Service, 1916–1925:
Revenue Freight Cars Loaded, average weekly.
Car Surplus and shortage, daily average.
Freight Accumulations, daily average.
x Reports temporarily discontinued.
xx Previous figures not available.
Data: American Railway Association, Car Service Division.

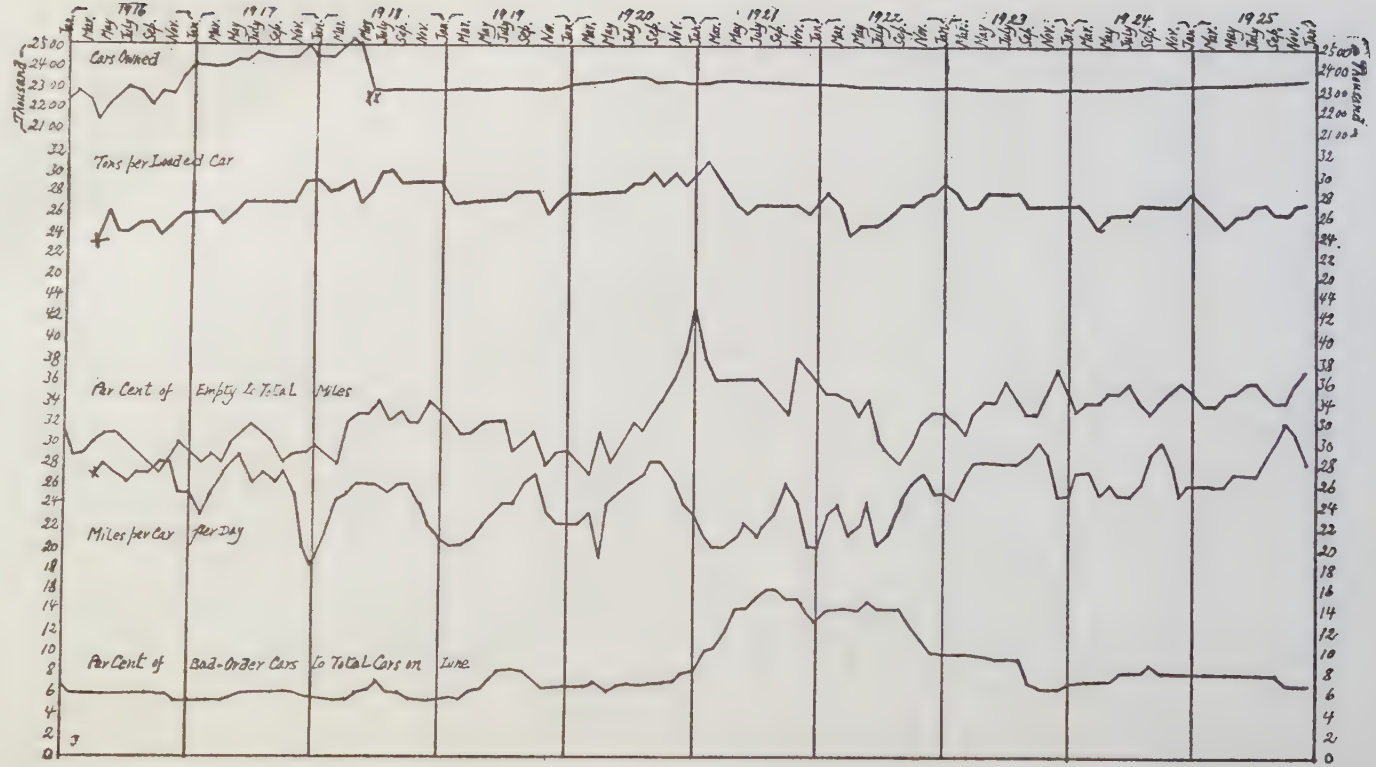
1916
1917
1918
1919
1920
1921
1922
1923
1924
1925
Thousand
Cars Owned
Tons per Loaded Car
Per Cent of Empty to Total Miles
Miles per Car per Day
Per Cent of Bad-Order Cars to Total Cars on Line

TABLE II

RAILWAY EQUIPMENT INSTALLED, RETIRED, AND IN NEED OF REPAIRS, ON CLASS 1 ROADS FROM 1920 TO 1925.

YEAR ENDING DEC. 31	LOCOMOTIVES		PER CENT IN NEED OF REPAIRS	FREIGHT CARS		PER CENT IN NEED OF REPAIRS
	INSTALLED	RETIRED		INSTALLED	RETIRED	
1920	1,017	1,254	24.5	36,044	75,197	7.0
1921	1,330	1,130	23.7	63,406	69,245	13.1
1922	1,226	1,682	24.9	105,394	126,471	12.8
1923	4,360	2,786	21.4	232,060	155,893	8.0
1924	2,746	2,529	18.7	213,789	118,441	7.8
1925	1,585	2,884	17.9	132,543	122,352	7.8

Source: I. C. C. annual report to the U. S. Congress in 1926.

CHART II. Freight Car Ownership, Physical Condition, and Performance, 1916–1925:
Freight Cars owned, as the first of each month
Per Cent of Bad-Order Cars to Total Cars on Line, as the first of each month
Tons per Loaded Car, average for the month
Miles per Car per Day, average for the month
Per Cent of Empty to Total Miles, average for the month
x Figures not available
xx Previous figures include Canadian Roads.
Data: American Railway Association, Car Service Division.

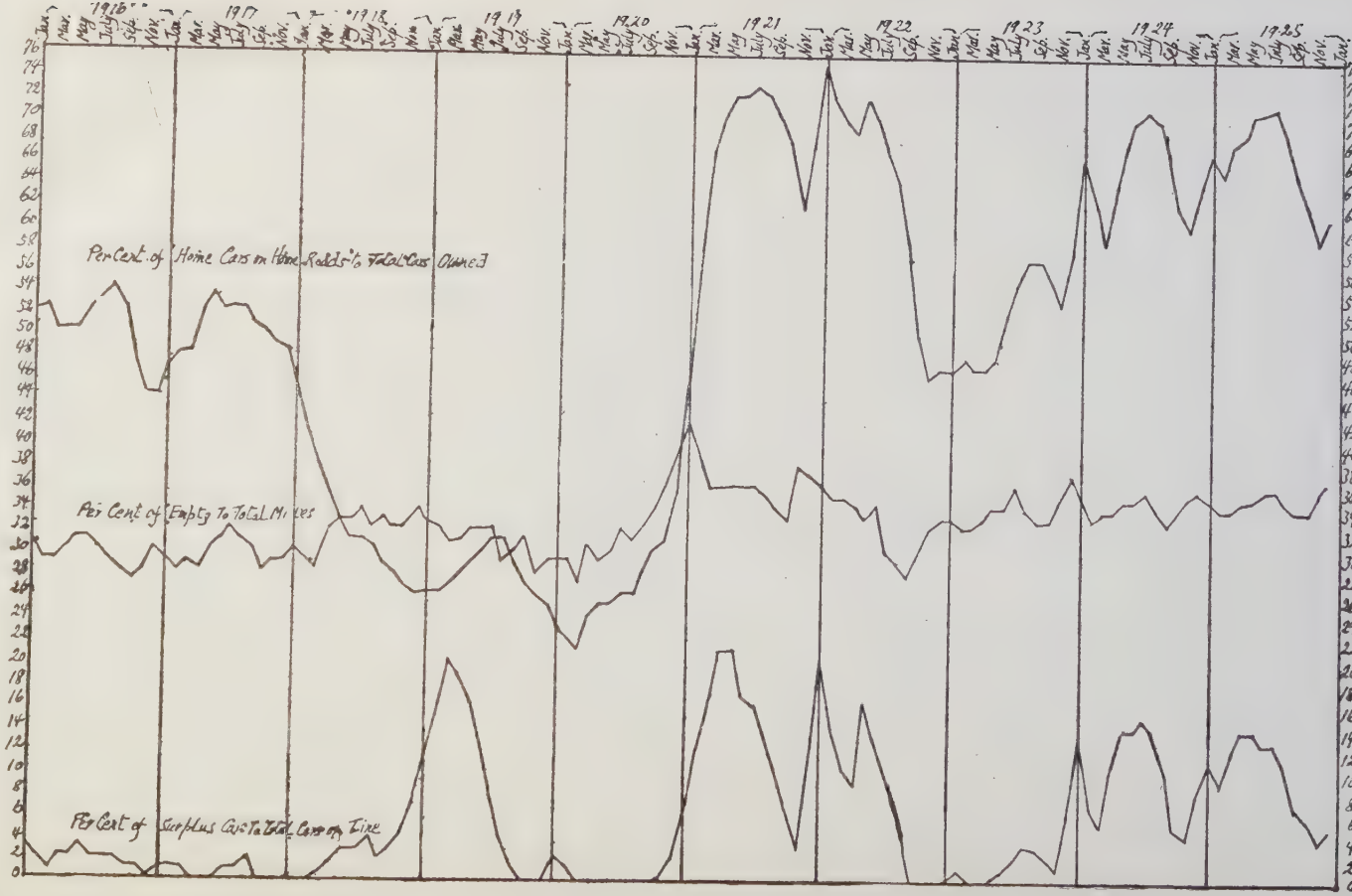
1916
1917
1918
1919
1920
1921
1922
1923
1924
1925
Per Cent of Home Cars on Home Roads to Total Cars Owned
Per Cent of Empty To Total Miles
Per Cent of Surplus Cars To Total Cars on Line

TABLE III

FREIGHT CAR PERFORMANCE ON CLASS I ROADS FROM 1920 TO 1925

YEAR ENDING DEC. 31	AVERAGE MILES PER CAR DAY	AVERAGE TONS PER LOADED CAR
1920	25.1	29.3
1921	22.4	27.6
1922	23.5	26.9
1923	27.8	27.9
1924	26.8	27.0
1925	28.3	27.9

Source: I. C. C. annual report to the U. S. Congress in 1926.

CHART III. Freight Car Supply and Distribution, 1916–1925.
Per Cent of Surplus Cars to Total Cars on Line, average for the month.
Per Cent of Home Cars on Home Roads to Total Cars owned, average for the month.
Per Cent of Empty to Total Miles, average for the month
Data: American Railway Association, Car Service Division.

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